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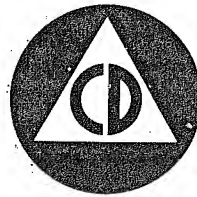
DEPARTMENT OF DEFENSE
OFFICE OF CIVIL DEFENSE



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1968

DEPARTMENT OF DEFENSE
OFFICE OF THE SECRETARY OF THE ARMY

Annual Report
of the
Office of Civil Defense



For Fiscal Year
1968

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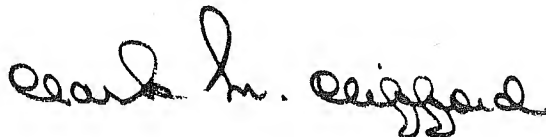
THE SECRETARY OF DEFENSE

WASHINGTON

26 December 1968

MEMORANDUM FOR THE PRESIDENT

In compliance with section 406 of the Federal Civil Defense Act of 1950 and section 5 of Executive Order 10952 of July 20, 1961, I submit herewith the seventh annual report of the Office of Civil Defense, covering civil defense functions assigned to me.

A handwritten signature in dark ink, reading "Clark M. Clifford". The signature is written in a cursive, flowing style with a large initial "C".

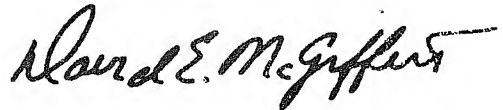
CLARK M. CLIFFORD

DEPARTMENT OF THE ARMY
OFFICE OF THE UNDER SECRETARY
WASHINGTON

27 November 1968

MEMORANDUM FOR THE SECRETARY OF DEFENSE

Submitted by the Director of Civil Defense, Mr. Joseph Romm, and transmitted herewith is the seventh annual report of the Office of Civil Defense.

A handwritten signature in dark ink, reading "David E. McGiffert". The signature is written in a cursive style with a long horizontal stroke at the end.

DAVID E. MCGIFFERT
UNDER SECRETARY OF THE ARMY

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INTRODUCTION

Civil Defense, a vital part of the national defense system, must start with the blunt assumption that an all out nuclear attack would claim millions of lives. Given this fact, the primary civil defense program objective in simple terms is to plan and implement reasonable measures which will maximize lifesaving without changing the basic institutions of the Nation.

From the start of a formalized nationwide civil defense program with the passage of the Federal Civil Defense Act of 1950, the rapidity and magnitude of changes—A-bomb to H-bomb, bombers to missiles, hypothetical danger to actual threat—complicated attempts to define the potential and limitations of civil defense.

Then, on May 25, 1961, President Kennedy discussed civil defense in a special message to the Congress on "Urgent National Needs." He recommended the initiation of a nationwide long-range program of identifying existing fallout shelter capacity and providing shelter in new and existing structures to protect millions of people against the hazards of radioactive fallout in the event of a large-scale nuclear attack. He announced his intention to assign major civil defense responsibilities to the Secretary of Defense.

Defense Department studies of a wide range of hypothetical nuclear attacks against the United States show that in large-scale nuclear attacks a fallout shelter system has a greater lifesaving potential for the investment involved than any other element of strategic defense and that it complements to the damage-limiting effectiveness of other strategic defense measures.

Active offensive and defensive systems are designed to deter enemy attack, or if this step should fail, to limit damage, especially from the immediate weapons effects, against which fallout shelters can provide only peripheral protection. Should the deterrence fail, the fallout shelter oriented civil defense program at this time is the fundamental means of limiting damage to our population from widespread effects of radioactive fallout.

In discussing this complex subject of defensive systems against nuclear attack, President Johnson stated:

"It is already clear that without fallout shelter protection for our citizens, all defense weapons lose much of their effectiveness in saving lives. This also appears to be the least expensive way of saving lives, and the one which has clear value even without other systems."

HIGHLIGHTS

Over the past 6 years, the Office of Civil Defense has developed, on an orderly basis, a substantial civil defense capability at all levels of Government. Through the maximum use of existing resources, both physical and organizational, a capability exists to increase measurably the likelihood of survival in event of a nuclear attack.

Highlights on the development of the Nationwide Fallout Shelter System during fiscal year 1968, included the following:

1. Public fallout shelter space for 16.3 million additional persons was located in 13,557 facilities, increasing the national inventory to more than 176.5 million fallout shelter spaces in 189,053 facilities.

2. There were 9,257 facilities licensed for use as public shelter in an emergency. This increased the number of licensed facilities to 109,725 with aggregate shelter space for about 108.9 million persons.

3. There were 6,438 facilities marked with standard fallout shelter signs. This increased the number of facilities marked to 107,456 with a total capacity to protect approximately 101.1 million persons.

4. Survival supplies issued to 8,033 facilities increased the total number of facilities stocked to 91,075. These have the capacity and sufficient supplies to accommodate 88.1 million persons for 8 days, or 52.7 million for 14 days.

Other highlights were:

1. Community Shelter Planning (CSP) contracts were executed to cover 37 additional large communities. This brought the total number of executed contracts to 194 which provided for development of emergency shelter use plans for 49.8 million people living in 244 counties throughout the United States. In smaller community areas, a total of 481 counties with a population of 10.9 million people had started development of shelter use plans.

2. Home Fallout Protection Surveys in 26 States, two New York counties, and the District of Columbia, resulted in the identification of 1.8 million shelter spaces with a Pf-40 or higher and almost 28 million spaces in the Pf 20-39 category.

3. The Direct Mail Shelter Development System, a procedure for contacting owners and architects of specific new buildings and offering them technical assistance for incorporating fallout protection in the design of the project, was tested in Arizona, Florida, Louisiana, Massachusetts, Tennessee, Texas, and Wisconsin for program effectiveness in increasing available shelter space.

4. The Fallout Shelter Analysis course was completed by 2,745 architects and engineers, bringing the grand total of fallout shelter analysts to more than 16,500.

5. The Civil Defense Telephone and Teletype System (NACOM 1) was augmented by installation of Automatic Digital Network (AUTODIN) terminals for secure on-line communications at three OCD regions.

6. The National Warning System (NAWAS) was strengthened by increasing the number of warning points from 893 to 986. In 369 of these locations, backup installations have been provided in protected areas to support emergency operations. Also, using matching funds, there were 255 NAWAS extensions which had been installed by fiscal yearend.

7. The Civil Defense Radio System (NACOM 2), serving as a backup system to NACOM 1, was extended to three additional States making it operational in 42 States, the District of Columbia, Puerto Rico, and the Canal Zone. Agreements have been signed with six additional States and American Samoa.

8. The Emergency Broadcast System (EBS), with 2,762 broadcasting stations had 629 participating with OCD in a fallout protection program to insure operational capability in emergencies. A total of 535 radio stations had completed construction for fallout protection and 471 had been provided with required equipment by yearend.

9. The nationwide radiological monitoring network was expanded by a net gain of 2,690 monitoring stations, increasing the cumulative total to 65,833. Shelter radiological monitoring capability was strengthened by placing monitoring equipment in 10,135 additional shelters making a combined total of 94,266 so equipped. The combined total of monitoring stations and shelters with monitoring equipment is 160,099.

10. State and local Emergency Operating Centers (EOC's) totaled 3,001 by June 30, 1968. This total included 75 additional State and local centers financed during the fiscal year with Federal matching funds.

11. The Damage Assessment System was updated to develop the best possible estimates of the potential range of damage to resources and population during and after a nuclear attack in order to provide a basis for the conduct of effective emergency operations to achieve national recovery.

12. Annual program papers and related semiannual progress reports were submitted by the 50 States and more than 4,300 local governments during the fiscal year, with these localities including some 87 percent of the total U.S. population.

13. The OCD Staff College trained 1,123 civil defense personnel and instructors during fiscal year 1968, making a cumulative total of 52,169 so trained at OCD schools since fiscal year 1951. A total of

52,673 State and local civil defense personnel received training through the Civil Defense University Extension Program (CDUEP), making a cumulative total of 240,961 participants since CDUEP was started in fiscal year 1963.

14. Emergency Operations Systems Development (EOSD) emphasis was continued on developing systems for the orderly increase of civil defense readiness in periods of heightened international tension, and on providing guidance to State and local governments on actions to take during such periods.

15. A National Civil Defense Exercise (CDEX-67), designed to exercise the concepts expressed in the National Civil Defense Emergency Operations Plan and the supporting Continuity of Operations Plan, was conducted with 48 States and approximately 2,200 local jurisdictions participating.

16. CSP emergency public information plans were funded by OCD for distribution to 5,000,000 people in 98 local jurisdictions throughout the United States.

17. Radiological monitors trained by the Army (CONARC), in the CDUEP, and through the Civil Defense Adult Education Program (CDAEP) during the fiscal year, totaled 33,658. In addition, 3,031 instructors were trained.

18. Increased understanding and involvement of public and private sector leaders and leadership groups in community action for civil defense resulted from knowledge acquired from various social science research findings together with numerous field activities during fiscal year 1968.

19. In public education, 374,441 persons were trained in Personal and Family Survival, and 5,102 teachers were trained and certified to teach the course. This brought the total number of graduates, including teachers, to more than 2.3 million. More than 2.3 million persons were trained in Medical Self-Help, making a cumulative total of about 8.3 million so trained.

20. Rural civil defense information was presented on 1,169 television programs, and 10,463 radio broadcasts, and there were 10,561 press releases to rural newspapers. There were more than 5,880,000 copies of rural civil defense materials distributed upon request or in connection with educational programs during fiscal year 1968.

21. Research progress and important technical data acquired during fiscal year 1968 was accomplished by a system of coordinated studies in shelter research, support systems, postattack, and systems evaluation research, based on assumed attacks on five selected urban localities. This effort promises to improve methods of analysing attack effects and civil defense planning. It will also provide guidance for establishing future requirements.

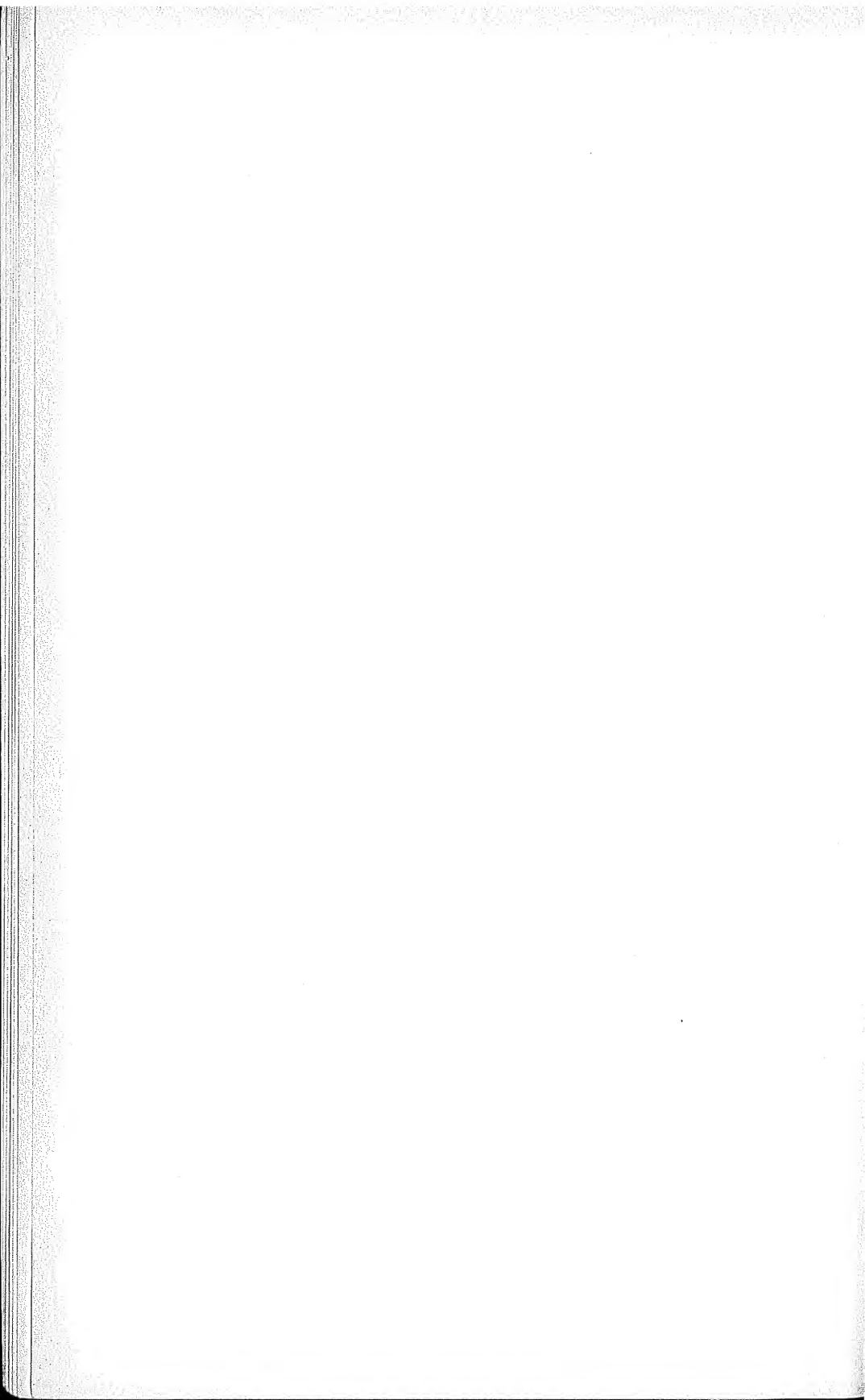
22. Emergency Public Information activities during fiscal year 1968 were directed primarily to planning, preparing, reviewing, evaluating, and issuing information that the public would need in a period of rising international tension. Important by-products and a secondary purpose of these activities were also realized as much of the information was adapted for current use in informing and training the public in survival measures.

23. Civil defense information was given to the public in many publications and periodicals, motion pictures, spot radio and television announcements, and by nationwide use of exhibits and posters.

24. Industry participation in the civil defense program was strengthened by liaison with major national organizations, industrial firms, and Federal agencies dealing directly with industry. Activities included conferences, seminars, and workshops, as well as dissemination of guidance information by exhibits, motion pictures, and distribution of civil defense publications.

25. Labor support of the civil defense program was increased by continual liaison with the labor trade unions, principally through the American Federation of Labor and the Congress of Industrial Organizations (AFL-CIO).

26. Participation in international civil defense activities of the North Atlantic Treaty Organization and the Central Treaty Organization and special arrangements with Canada provided for a meaningful exchange of civil defense concepts.



THE NATIONAL CIVIL DEFENSE PROGRAM

Development of the civil defense program during fiscal year 1968 was continued within the framework of the balanced program established by the Department of Defense in fiscal year 1962. The structure of the program is based upon elements of a comprehensive civil defense effort which includes (1) fallout shelter, (2) warning and emergency operations, and (3) those supporting activities necessary to the successful execution of the substantive program elements. In support of practically every element of the civil defense program, some type of financial assistance to State and local governments is available, whether directly or indirectly.

MAJOR EMPHASIS

During fiscal year 1968, primary emphasis continued on the performance of engineering surveys of existing structures across the United States to identify the fallout protection inherent in such structures and to make the most efficient use of shelter space located. This program is the core of our total Civil Defense Program, as damage limiting studies of potential attacks against both military and population targets have consistently concluded that this effort offers substantial lifesaving potential at the lowest cost.

Support of the program at the Federal level was coordinated by the Office of Civil Defense and included use of resources of the Department of Defense as well as those of other Federal Agencies.

A National Fallout Shelter Survey (NFSS) was started in late 1961 to locate potential fallout shelter space in large structures—space meeting DoD shelter standards and which would accommodate 50 or more persons in the event of attack. In addition, the survey identifies fallout protection in smaller buildings, other than one-, two-, and three-family homes (shelter capacity of 10 to 49 persons), where needed. Surveys are also being carried to private householders under the Home Fallout Protection Survey (HFPS) aimed at the more than 25 million U.S. homes with basements. These surveys are highly automated with the Army Corps of Engineers managing the NFSS survey and the U.S. Bureau of the Census the HFPS survey for OCD.

Not all of this shelter space is well located in terms of population distribution. Part of this shortage can be filled by promoting the voluntary design of improved fallout shielding in new buildings.

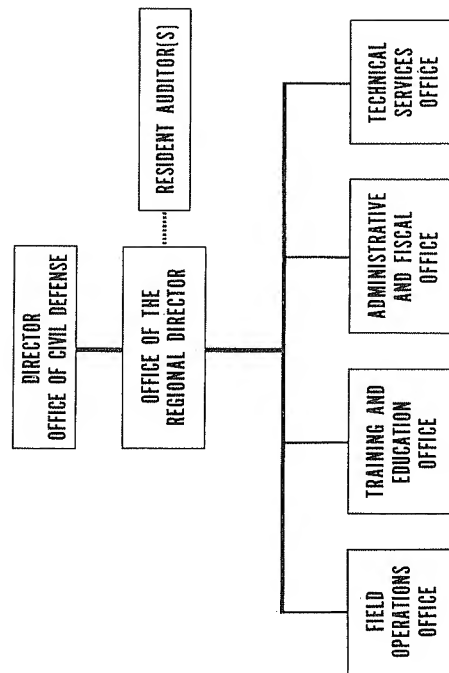
Many architects and engineers have been trained under Department of Defense standards as fallout shelter analysts; they are professionally skilled in the use of "slanting" techniques incorporating fallout protection in the design of new structures without adversely affecting the normal function, appearance, or cost of the buildings. In addition, the Direct Mail Shelter Development System (DMSDS), a systematic procedure for contacting owners and architects of specific new buildings and offering them technical assistance for incorporating fallout protection in the design of the project, is administered by the OCD and was tested in seven States during fiscal year 1968.

To develop practical procedures in each jurisdiction for efficient use of the best available fallout protection, the OCD Community Shelter Planning (CSP) program was started in fiscal year 1966. CSP, the foundation of local emergency readiness, informs each citizen on where to go and what to do, and prepares each department of local government to support the plan and meet its responsibilities in time of major disaster.

ORGANIZATION AND MANAGEMENT

Organization.—The Office of Civil Defense (OCD) is responsible for conducting the civil defense program at the Federal level. The Director of Civil Defense is directly responsible to the Secretary of the Army. The bases for this organization are departmental directives issued by the Secretary of Defense subsequent to Executive Order 10952, "Assigning Civil Defense Responsibilities to the Secretary of Defense and Others," effective August 1, 1961. From August 31, 1961, to April 1, 1964, the OCD was headed by the Assistant Secretary of Defense (Civil Defense). On March 31, 1964, civil defense functions and responsibilities, delegated to the Secretary of Defense by Executive Order 10952, were assigned to the Secretary of the Army, who established the OCD within his office and delegated the functions to the Director of Civil Defense.

The organizational structure at the end of fiscal year 1968 is shown in figure 1. The manpower authorization as approved by Congress was 831 permanent civilian positions or 18 fewer than in fiscal year 1967. The decrease resulted when personnel spaces were transferred to the Office of the Secretary of the Army (OSA) in support of an agreement that OSA perform all personnel, security, and certain office service functions for OCD. The 831 OCD personnel spaces authorized at the end of the fiscal year were distributed as follows: 357 at the departmental level, 419 at eight OCD regional offices, and 55 at various other field locations. (See figs. 2 and 3.)



JULY 1966

Figure 2.—OCD regional offices organization chart.

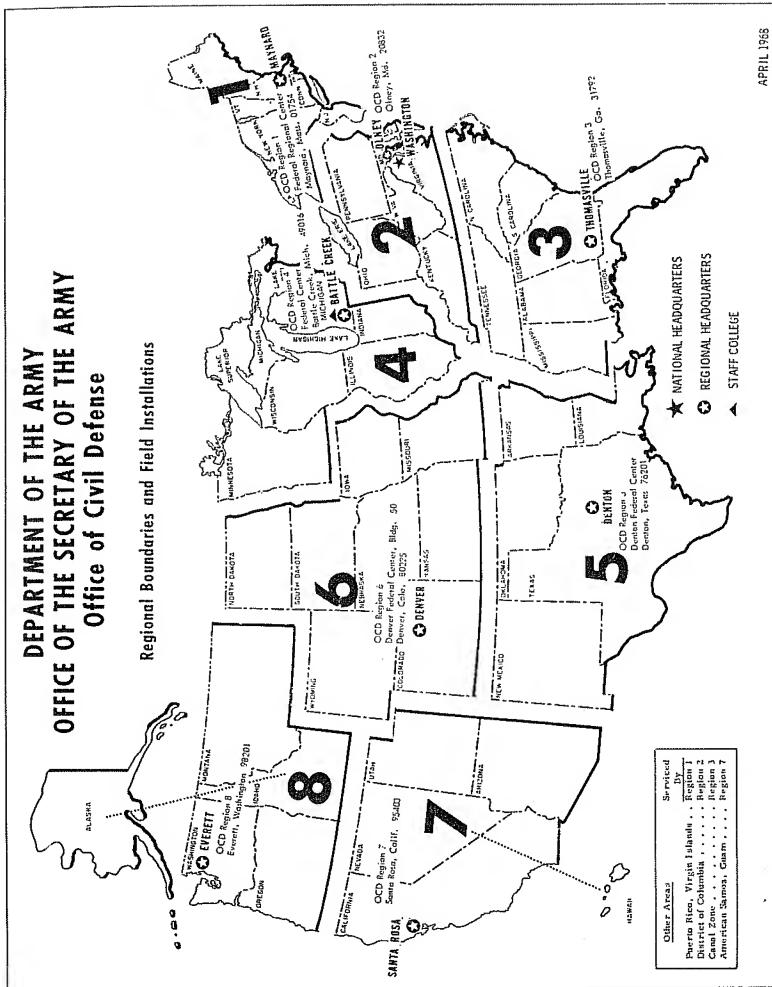


Figure 3.—OCD regions.

Management.—During fiscal year 1968, the OCD used the systems described below in the management of major operational projects and programs. The primary objective of these systems is to provide current, accurate information on civil defense programs so that program managers can plan, monitor, and evaluate program progress. The output of the systems also provides top level management with summary information for management decisions.

The Contract Register provided an automated means for reporting data for improved contract management on all OCD contracts. Improvements to the system and extension of its use were continued throughout fiscal year 1968, particularly in financial management and performance reporting.

The Integrated Management Information System (IMIS) computer-processed the fiscal year 1968 local program papers and progress reports, and furnished summarized information on planned and accomplished efforts in civil defense programs at local levels. Turn-around forms provided progress reports for each 6-month period during the year. National, regional, and State summaries were also available in output reports from this system.

The Architects and Engineers Directory was in constant use during the year. Periodic updating of the data file added information on new fallout shelter analysts as they completed training courses.

The Emergency Operating Center (EOC) Report provided an automated means for processing, summarizing, and analyzing information on the construction and readiness of State and local government EOC's.

The Home Fallout Protection Survey provided individual homeowners with computer-calculated estimates of the fallout protection afforded by their homes, and also provided OCD with planning information.

The computer-oriented Damage Assessment System provided estimates of the potential range of damage resulting from varying enemy capabilities in an assumed or actual attack. The system also included backup for the manual computation of damage.

Management surveys were initiated as part of top management's continuing review of the OCD organization to insure an effective organizational structure and efficient utilization of available manpower resources.

To provide data for efficient administration and to insure compliance with program requirements, internal reviews were conducted at OCD headquarters and three OCD regional offices. Audits were performed in every State and in more than 700 political subdivisions. These audits covered the matching funds financial assistance program administration procedures, including expenditures for State and local

personnel and administrative expenses, supplies and equipment, and emergency operating centers program. These audits produced recommendations for cost reductions in these areas amounting to over \$436,000 and resulted in improving the efficiency of program administration as well as clarifying policy decisions and operational procedures.

In addition, interim audits have been completed to date on 46 Radio-logical Defense Equipment Maintenance Agreements and 42 Community Shelter Planning State Contracts, which have clarified the applicable cost principles and terms of the agreements.

FINANCIAL SUMMARY

Funds available during fiscal year 1968 for carrying out civil defense operations totaled approximately \$108.6 million: \$86.1 million of new fiscal year 1968 appropriations, \$0.2 million in reimbursable orders from other agencies, and \$22.3 million carried over into fiscal year 1968 from prior year appropriations. Of this total, \$105.8 million was apportioned by the Bureau of the Budget early in the year for execution of the fiscal year 1968 program and \$2.8 million was apportioned at yearend to finance part of the fiscal year 1969 program.

Table 1 shows the planned application of the funds programmed for obligation in fiscal year 1968, and the actual obligations for specific budget activities. The Office of Civil Defense obligated \$100.1 million or 95 percent, of the 105.8 million programmed for obligation.

FEDERAL RESOURCES

Resources of the Department of Defense, including those of the Armed Forces, as well as those of numerous other Federal agencies were widely used in developing and operating the civil defense program. For the seventh consecutive year, the OCD continued to develop and coordinate this support at the Federal level.

Department of Defense Activities

Extensive use of DoD resources is indicated throughout this report, but some of the major support activities are summarized in this section.

The nationwide fallout shelter survey operations, which were principally of an updating nature during fiscal year 1968, were conducted for the OCD by the Army Corps of Engineers and the Naval Facilities Engineering Command. These agencies conducted nationwide updating surveys including surveys of small structures in community shelter planning areas, assisting in engineering case studies, and training fallout shelter analysts. The Army Corps of Engineers operated the National Civil Defense Computer Facility, and let and managed CSP contracts.

TABLE 1.—*Financial summary for fiscal year 1968*

[In thousands]

Budget activity	Funds available for obligation	Funds obligated
GRAND TOTAL.....	\$105, 803	\$100, 135
OPERATION AND MAINTENANCE TOTAL.....	66, 225	65, 900
Warning and detection.....	5, 837	5, 789
Warning systems.....	933	930
Detection and monitoring systems.....	957	953
Warehousing and maintenance.....	3, 947	3, 906
Emergency operations.....	19, 396	19, 271
Training and education.....	12, 072	12, 034
Emergency operations systems development.....	1, 413	1, 410
Emergency information.....	3, 558	3, 499
Damage assessment.....	1, 528	1, 515
Broadcast station protection program.....	366	356
Other emergency operations activities.....	459	457
Financial assistance to States.....	28, 198	28, 147
Personnel and administrative expenses.....	18, 500	18, 451
Survival supplies, equipment and training.....	4, 130	4, 128
Emergency operating centers.....	5, 568	5, 568
Management.....	12, 794	12, 693
RESEARCH, SHELTER SURVEY AND MARKING, TOTAL.....	39, 478	34, 139
Shelters.....	31, 738	26, 789
Shelter survey and marking.....	15, 534	12, 265
Shelter provisions.....	230	21
Warehousing and transportation.....	3, 114	2, 363
Federal regional emergency operating centers.....	6, 034	5, 754
Shelter development.....	6, 823	6, 389
Improvement of shelters.....	3	(3)
Research and development.....	7, 740	7, 350
CONSTRUCTION OF FACILITIES, TOTAL.....	100	96

Under OCD policy direction and control, the Defense Supply Agency furnished logistics support in managing OCD shelter supplies. With the exception of radiological instruments, procured by the General Services Administration, this included all logistical operations involving shelter supplies, management of the OCD emergency engineering equipment, and the use of technical military capabilities for food container research and development of procurement specifications, when needed. The Civil Defense Materiel Division of the Defense Supply Agency, using Veterinary Corps inspectors, examined all classes of civil defense shelter supplies under the Quality Check Program. The Military Traffic Management and Terminal Service of the Department of the Army determined routes, carriers, and transportation costs for shipping shelter supplies between warehouses.

Under OCD policy control, the management, direction, technical operations, and maintenance of civil defense communications systems, including the Civil Defense Telephone and Teletype System, the Civil Defense Radio System, and the National Warning System, were the responsibility of the U.S. Army Strategic Communications Command. The OCD warning centers relied upon the North American Air Defense Command for warning information.

Publications services, such as procuring printing and binding, distributing new publications, maintaining reserve stocks, and filling requisitions from State and local governments and the general public, were provided by The Adjutant General's Office, Department of the Army. This office also controlled the selection and assignment of Standby Reserve officers of all the military services to fill requests for assistance from civil defense officials of State and local governments.

Information and studies supporting the role of civil defense in national defense and required for OCD damage assessment and operational planning were furnished by the Joint Chiefs of Staff, the Defense Atomic Support Agency, the Weapons Systems Evaluation Group, and the National Military Command Systems Support Center.

Military training resources were provided for civil defense purposes. Subordinate commands of the U.S. Continental Army Command trained State and local personnel in radiological monitoring and explosive ordinance reconnaissance. The Army Pictorial Service developed and produced the scripts for training and educational films for the OCD. The U.S. Army Military Police School, Fort Gordon, Ga., included civil defense material in courses offered to industrial managers and executives.

The Surgeon General of the Army contributed training in handling mass casualties for U.S. Army Reserve and National Guard personnel as well as for personnel of civil defense agencies.

The Department of the Air Force Civil Air Patrol continued to cooperate with the OCD in planning procedures for performing emergency air flight missions.

The United States Coast Guard continued to cooperate with the OCD in monitoring NAWAS 24 hours a day at the Rescue Coordination centers for the purpose of forwarding OCD warnings of enemy attack and radiological fallout to merchant vessels in or near the territorial waters.

The Departments of the Army, Navy, and Air Force, together with the Public Health Service, assist in the Medical Education for National Defense (MEND) program of the Department of Health, Education, and Welfare, and the Department of Defense. Under the MEND program, students and faculty of the Nation's medical colleges are offered basic instruction in principles for the practice of medicine under emergency conditions or in a hostile environment. This program also provides them with current field medical doctrine developed in these agencies.

Civil defense guidance materials were distributed by industrial defense survey officers of the Continental Army Command, the Army Materiel Command, and the Corps of Engineers in connection with their surveys of certain industrial facilities important to the national defense. Recommendations made by the survey officers relating to their inspection of physical security and emergency preparedness measures at these facilities are consistent with guidance material issued by the OCD.

During fiscal year 1968, the Adjutants General of the 48 contiguous States continued their military support of civil defense preattack planning functions under the planning guidance of the CONUS Army commanders. To further the military support of civil defense preattack planning missions, the CONUS Army commanders and the National Guard Bureau held conferences at Charleston, S.C., Austin, Tex., Charleston, W. Va., Boise, Idaho, and Minneapolis, Minn., during the year. OCD representatives were present at all conferences as observers.

Policy direction and guidance for preattack and postattack military support of civil defense is provided by DoD Directive 3025.10, dated 29 March 1965. In addition, the Services issued implementing regulations and the Joint Chiefs of Staff approved the joint Basic Plan for Defense, Other Than Aerospace Defense, of the Continental United States and Military Support of Civil Defense (DEF-CONUS-OTAD-CD). In Alaska, Hawaii, Puerto Rico, and other overseas areas of the United States, military support of civil defense is provided by the appropriate unified commander.

A total of 227 National Guard technicians, authorized and funded by the National Guard Bureau, have been provided the Adjutants General for preattack military support planning purposes. Reserve personnel of the Services are being detailed by their parent Service to perform preattack and postattack liaison with Adjutants General.

The Army, with DoD approval, authorized USCONARC and CONUS Army commanders to establish Reinforcement Training Units (RTU's) for civil defense, or military support of civil defense, preattack planning and training. These RTU's are not intended to be postattack operational units, and membership in an RTU can in no way impede mobilization of a United States Army Reserve member as a reinforcement for the Army during an emergency. Membership in an RTU is restricted to members of the Individual Ready Reserve. Establishment of RTU's is authorized for one of four possible purposes: (1) Planning and training for military support of civil defense within a State, (2) planning and training for military support of civil defense above the State level, (3) planning and training for civil defense at State level or below, and (4) planning and training for civil defense at the OCD regional and national levels.

Federal Agency Coordination

The OCD continued to coordinate the civil defense work of Federal agencies to assure that functions were carried out in consonance with civil defense responsibilities assigned to the Secretary of Defense by Executive Order 10952, July 20, 1961. Much of this coordination was achieved within the framework of several other Executive orders assigning civil defense responsibilities and emergency preparedness functions to various departments and agencies.

Effective coordination and progress were also achieved in civil defense through contractual arrangements with several departments and agencies. This enabled the OCD to use its special competence in coordinating and expediting many of its functions in accordance with Executive Order 10952. These arrangements are discussed, as applicable, throughout this report; e.g., the Medical Self-Help and Civil Defense Adult Education Programs conducted for the OCD by the Department of Health, Education, and Welfare; and civil defense research, compiling damage assessment data, and rural civil defense work carried out by the Department of Agriculture.

The OCD continued to work closely with the Office of Emergency Planning and other Federal agencies in developing postattack plans to manage survival resources.

The Interagency Civil Defense Committee continued to enhance the value of daily contacts and working relationships between personnel of Federal agencies pursuing related civil defense objectives.

Established in fiscal year 1963, the Regional Civil Defense Coordinating Boards continued to coordinate civil defense planning of military departments and Federal agencies with State and local civil defense operations.

FINANCIAL ASSISTANCE

The objective of the OCD financial assistance program is to increase the civil defense readiness of State and local governments by furnishing matching funds to assist in the procurement of emergency supplies, equipment, training, and emergency operating centers and to support personnel and administrative costs of civil defense staffs required to conduct a viable civil defense program. The authority for this program is the Federal Civil Defense Act of 1950, as amended, Section 201(i) and the amendment to this law of 1958 which added Section 205. Financial assistance authority was due to expire on June 30, 1968, for (1) personnel and administrative expenses under Section 205, (2) travel expenses and per diem allowances of students at OCD schools under subsection 201(e), and (3) radiological instrument grants and maintenance. The Congress reviewed these programs and enacted Public Law 90-336 extending authority for them for an additional 4 years, until June 30, 1972. Federal surplus property, under the Federal Property and Administrative Services Act of 1949, as amended, may be donated also to States and their political subdivisions for civil defense purposes.

The four basic requirements for a unit of government to be eligible for OCD financial assistance are:

1. Civil defense organizational arrangements must be established pursuant to law.
2. There must be an OCD-approved operational plan.
3. There must be an approved program paper for the current Federal fiscal year.
4. The local agency must comply with Title VI of the Civil Rights Act of 1964.

The program paper is the key instrument for determining whether a State or political subdivision will be granted Federal matching funds. It describes what will be accomplished during the next fiscal year, and the number of employees and funds needed to carry out these activities. Progress is reported twice a year. Financial assistance grants are directly related to program goals and reported progress.

Supplies, Equipment and Training, and Emergency Operating Centers

The primary source of supplies and equipment needed in civil defense emergencies would be the items and systems already in place required for day-to-day peacetime operation. For example, the existing communications systems would be used to fulfill most emergency communications requirements and would be augmented only to fill the gaps to assure coordinated emergency operations.

Requirements planning and resource inventory are necessary to take maximum advantage of these existing resources. It is also necessary to train regular operators in emergency procedures and additional persons as auxiliary operating personnel. Special items of equipment may also be required to assure maximum use of independent systems in centralized emergency operations, and to meet unique civil defense requirements. Centralized control of operations is essential to assure the most effective use of services, facilities, and supplies essential to survival of citizens. Emergency Operating Centers provide protected facilities with communications, emergency power, and adequate space and equipment for effective direction and control.

To receive Federal contributions for supplies, equipment, and training courses, or for the establishment of an EOC, local Civil Defense Directors or other appropriate officials must submit a project application for matching funds with a justification to the State civil defense agency. Upon approval, it is forwarded to the OCD regional office. If approved at that level, the applicant is notified and the purchase may be made. The applicant is reimbursed for half of the cost upon submission of a bill to the OCD regional office. Use of this equipment is intended for enemy-caused disaster but may be used during peacetime emergencies.

Personnel and Administrative Expenses

At fiscal yearend, all 50 States, the District of Columbia, Guam, the Virgin Islands, Puerto Rico, American Samoa, and 1,943 local governments throughout the country received Federal matching funds for personnel and administrative expenses. The population of the counties and cities where these funds are being used to administer a civil defense program is more than 125.6 million people. The civil defense preparations of these governments, based upon national civil defense program guidance, serve primarily to protect people from the effects of nuclear attack and, as a by-product, also enhance the local capability to cope with natural disasters.

As indicated above, the Federal Government shares in the cost of employing professional people (and their clerical support) to plan and coordinate the special activities not ordinarily a part of government; e.g., the warning system, the fallout shelter system, the radiological monitoring system, and measures for emergency direction and control. The civil defense staffs are skilled planners and State and local government technicians serving their governments under the direct authority of their elected officials. In substance, the civil defense personnel perform a coordinating or specialist function, involving the training or preparation of other regular elements of government for emergency functions. This group of civil defense employees, 4,311 full-time and 1,651 part-time at the end of fiscal year 1968, are in turn responsible for the planning, organization, and training of some 2,750,000 State and local government employees and volunteers who carry out the civil defense programs of the regular departments of government. All departments of government must be used to carry out the civil defense program, and civil defense personnel do not duplicate the functions of these regular departments.

The OCD allocates appropriated personnel and administrative funds directly to the States; the States, in turn, allocate these funds to their political subdivisions. Each political subdivision applying for matching funds requests them from the State civil defense agency. Upon State approval, the consolidated request is submitted to the OCD regional office where it is approved or disapproved.

Civil defense employees of States and political subdivisions participating in this program must be appointed under a merit system meeting the Federal "Standards for a Merit System of Personnel Administration" which are also applicable to the grant-aided programs administered by the Departments of Labor and Health, Education, and Welfare. The development of proper and efficient administration of the civil defense program at State and local levels requires clear definition of function, the employment of the most competent available personnel, and the development of staff morale and individual efficiency. Application of personnel standards on a merit basis contributes to the achievement of these objectives. The Office of Civil Defense is interested in the development and continued improvement of the merit systems, but exercises no authority over the selection, tenure of office, or compensation of any individual employed in conformity with the provisions of such systems.

Statistical data.—Approximately \$4.1 million was obligated during fiscal year 1968 for supplies, equipment, and training. Of this amount, approximately 83 percent was used for communications and warning. (See table 2.)

TABLE 2.—Fiscal year 1968 Federal contributions to State and local governments for supplies, equipment, training, and emergency operating centers

Area	Amounts obligated ¹		
	Total	Supplies, equipment, and training	Emergency operating centers
Total.....	\$9, 696, 278	\$4, 128, 024	\$5, 568, 254
REGION ONE.....	2, 198, 840	979, 136	1, 219, 704
Connecticut.....	154, 247	98, 327	55, 920
Maine.....	191, 699	134, 264	57, 435
Massachusetts.....	218, 036	204, 036	14, 000
New Hampshire.....	39, 765	15, 457	24, 308
New Jersey.....	184, 295	56, 264	128, 031
New York.....	1, 100, 781	433, 385	667, 396
Rhode Island.....	25, 961	23, 586	2, 375
Vermont.....	21, 990	8, 995	12, 995
Puerto Rico.....	262, 066	4, 822	257, 244
Virgin Islands.....	0	0	0
REGION TWO.....	1, 274, 091	371, 763	902, 328
Delaware.....	27, 494	22, 427	5, 067
District of Columbia.....	5, 630	1, 156	4, 474
Kentucky.....	36, 707	25, 692	11, 015
Maryland.....	117, 190	91, 426	25, 764
Ohio.....	104, 675	58, 719	45, 956
Pennsylvania.....	509, 199	154, 870	354, 329
Virginia.....	207, 201	14, 027	193, 174
West Virginia.....	265, 995	3, 446	262, 549
REGION THREE.....	804, 471	212, 664	591, 807
Alabama.....	76, 532	44, 707	31, 825
Florida.....	112, 707	45, 647	67, 060
Georgia.....	43, 129	33, 492	9, 637
Mississippi.....	193, 374	14, 710	178, 664
North Carolina.....	42, 067	38, 680	3, 387
South Carolina.....	54, 987	10, 501	44, 486
Tennessee.....	281, 675	24, 927	256, 748
Canal Zone.....	0	0	0
REGION FOUR.....	1, 184, 114	807, 799	376, 315
Illinois.....	465, 143	333, 301	131, 842
Indiana.....	32, 944	31, 444	1, 500
Michigan.....	208, 399	121, 862	86, 537
Minnesota.....	172, 433	143, 809	28, 624
Wisconsin.....	305, 195	177, 383	127, 812

See footnote at end of table

TABLE 2.—Fiscal year 1968 Federal contributions to State and local governments for supplies, equipment, training, and emergency operating centers—Continued

Area	Amounts obligated ¹		
	Total	Supplies, equipment, and training	Emergency operating centers
REGION FIVE.....	\$702, 375	\$120, 856	\$581, 519
Arkansas.....	136, 692	13, 532	123, 160
Louisiana.....	65, 223	18, 610	46, 613
New Mexico.....	78, 966	2, 866	76, 100
Oklahoma.....	153, 900	57, 462	96, 438
Texas.....	267, 594	28, 386	239, 208
REGION SIX.....	1, 601, 478	886, 688	714, 790
Colorado.....	94, 074	46, 721	47, 353
Iowa.....	177, 349	173, 390	3, 959
Kansas.....	162, 414	148, 239	14, 175
Missouri.....	420, 595	110, 407	310, 188
Nebraska.....	186, 924	179, 924	7, 000
North Dakota.....	152, 759	7, 224	145, 535
South Dakota.....	345, 161	214, 396	130, 765
Wyoming.....	62, 202	6, 387	55, 815
REGION SEVEN.....	1, 614, 220	686, 736	927, 484
Arizona.....	65, 404	36, 116	29, 288
California.....	1, 142, 050	356, 082	785, 968
Hawaii.....	137, 115	86, 107	51, 008
Nevada.....	189, 785	183, 523	6, 262
Utah.....	79, 866	24, 908	54, 958
American Samoa.....	0	0	0
Guam.....	0	0	0
REGION EIGHT.....	316, 691	62, 384	254, 307
Alaska.....	8, 543	7, 025	1, 518
Idaho.....	181, 474	9, 318	172, 156
Montana.....	35, 265	4, 062	31, 203
Oregon.....	19, 628	4, 485	15, 143
Washington.....	71, 781	37, 494	34, 287

¹ Figures may not add to exact totals due to rounding.

All States, the District of Columbia, Puerto Rico, the Virgin Islands, American Samoa, Guam, and 1,943 of their political subdivisions participate in the Personnel and Administrative Expenses Program. During fiscal year 1968, OCD made \$18.5 million available for this program. The number of State and local employees performing civil defense functions totaled 5,962 at the end of fiscal year 1968. (See table 3.)

TABLE 3.—Fiscal year 1968 Federal contributions for civil defense personnel and administrative expenses

Area	Amount obligated	Political subdivisions	
		Number participating	Staff
Total.....	\$18, 450, 499	1, 943	5, 962
REGION ONE.....	5, 363, 873	317	1, 591
Connecticut.....	249, 150	23	81
Maine.....	248, 066	59	154
Massachusetts.....	622, 399	50	202
New Hampshire.....	69, 388	17	35
New Jersey.....	497, 500	59	190
New York.....	3, 213, 009	34	695
Rhode Island.....	135, 197	8	40
Vermont.....	52, 244	6	18
Puerto Rico.....	260, 755	61	171
Virgin Islands.....	16, 165	0	5
REGION TWO.....	2, 066, 401	205	732
Delaware.....	94, 845	4	31
District of Columbia.....	154, 955	0	28
Kentucky.....	209, 657	51	108
Maryland.....	436, 906	20	118
Ohio.....	283, 226	26	109
Pennsylvania.....	556, 855	48	207
Virginia.....	227, 272	33	80
West Virginia.....	102, 685	23	51
REGION THREE.....	2, 760, 792	358	990
Alabama.....	421, 000	59	140
Florida.....	591, 571	52	199
Georgia.....	537, 453	87	200
Mississippi.....	198, 738	47	97
North Carolina.....	470, 970	53	157
South Carolina.....	311, 595	33	104
Tennessee.....	229, 465	27	93
Canal Zone.....	0	0	0

TABLE 3.—Fiscal year 1968 Federal contributions for civil defense personnel and administrative expenses—Continued

Area	Amount obligated	Political subdivisions	
		Number participating	Staff
REGION FOUR.....	\$2, 047, 526	334	706
Illinois.....	468, 182	85	174
Indiana.....	132, 779	22	51
Michigan.....	433, 838	69	124
Minnesota.....	553, 478	91	203
Wisconsin.....	459, 249	67	154
REGION FIVE.....	1, 369, 735	166	476
Arkansas.....	240, 000	39	93
Louisiana.....	364, 366	15	108
New Mexico.....	83, 000	7	24
Oklahoma.....	244, 500	36	85
Texas.....	437, 869	69	166
REGION SIX.....	1, 314, 089	331	602
Colorado.....	182, 605	28	63
Iowa.....	232, 975	64	114
Kansas.....	173, 813	52	85
Missouri.....	226, 829	55	108
Nebraska.....	180, 000	31	75
North Dakota.....	127, 750	45	62
South Dakota.....	131, 817	36	71
Wyoming.....	58, 300	20	24
REGION SEVEN.....	2, 767, 076	128	620
Arizona.....	195, 830	23	69
California.....	2, 094, 868	82	437
Hawaii.....	198, 975	4	37
Nevada.....	161, 500	11	41
Utah.....	91, 000	8	28
American Samoa.....	6, 237	0	3
Guam.....	18, 666	0	5
REGION EIGHT.....	761, 007	104	245
Alaska.....	120, 000	3	18
Idaho.....	89, 500	25	47
Montana.....	134, 956	48	66
Oregon.....	86, 553	10	25
Washington.....	329, 998	18	89

Surplus Property

The Federal Property and Administrative Services Act of 1949, as amended by Public Law 655, 84th Congress, authorized the donation of Federal surplus property for use in any State for civil defense purposes. When no agency or department of the Federal government has need for equipment which another Federal agency wishes to dispose of, the equipment is declared "surplus" and can be donated for use in any State for civil defense, health, welfare, and educational purposes.

Eligibility requirements are the same as those for obtaining Supplies, Equipment and Training, and Emergency Operating Centers contributions.

The OCD has developed a list of surplus items deemed useful and necessary for civil defense purposes. This list includes generators, motors, welding equipment, duplicating and printing equipment, winches, hoists, chain, rope, and firefighting, rescue and safety equipment, as well as many other items. When a locality has met eligibility requirements during any given fiscal year, it may acquire needed equipment for use in developing its civil defense capability against enemy attack. Occasionally, when a locality needs equipment not on the list of useful and necessary items, it may apply to OCD for special consideration.

Surplus equipment obtained for civil defense purposes may be used to combat other types of local disasters. A locality obtaining surplus property must pay a small handling fee to the State. OCD would normally pay one-half of transportation costs to the locality. However, transportation costs of surplus property have been suspended for fiscal year 1969.

Statistical data.—Since the program was started in 1957, property having an original cost of approximately \$402 million has been transferred to State and local governments. Property valued at approximately \$27 million was donated to State and local governments during fiscal year 1968. (See table 4.)

STATE AND LOCAL PARTICIPATION

Readiness of State and local governments to carry out their civil defense functions is a principal objective of the civil defense program. At the end of fiscal year 1968, all 50 States, the District of Columbia, Puerto Rico, Guam, the Virgin Islands, and more than 4,300 local political subdivisions had active official civil defense programs documented by formal program papers submitted to and approved by the OCD. Further evidence of nationwide participation was the fact that

TABLE 4.—Federal surplus property transferred to State and local governments for civil defense purposes
[In thousands of dollars]

Area	Acquisition cost of transferred property ¹	
	Fiscal years 1967 through 1968	Fiscal year 1968
Total.....	\$401, 996	\$27, 041
REGION ONE.....	68, 140	4, 641
Connecticut.....	7, 111	333
Maine.....	9, 243	682
Massachusetts.....	18, 327	1, 423
New Hampshire.....	3, 062	168
New Jersey.....	12, 606	1, 011
New York.....	10, 836	488
Rhode Island.....	3, 005	211
Vermont.....	1, 356	166
Puerto Rico.....	2, 594	159
Virgin Islands.....	0	0
REGION TWO.....	33, 980	1, 916
Delaware.....	520	25
District of Columbia.....	0	0
Kentucky.....	4, 402	268
Maryland.....	6, 789	542
Ohio.....	4, 937	228
Pennsylvania.....	9, 511	306
Virginia.....	5, 355	367
West Virginia.....	2, 467	180
REGION THREE.....	88, 319	6, 235
Alabama.....	12, 947	611
Florida.....	20, 607	1, 287
Georgia.....	20, 617	1, 586
Mississippi.....	12, 246	1, 218
North Carolina.....	12, 117	625
South Carolina.....	4, 727	395
Tennessee.....	5, 056	512
Canal Zone.....	0	0
REGION FOUR.....	47, 000	2, 369
Illinois.....	12, 960	545
Indiana.....	5, 574	123
Michigan.....	20, 446	1, 330
Minnesota.....	5, 160	254
Wisconsin.....	2, 860	116

See footnote at end of table

TABLE 4.—Federal surplus property transferred to State and local governments for civil defense purposes—Continued

[In thousands of dollars]

Area	Acquisition cost of transferred property ¹	
	Fiscal years 1957 through 1968	Fiscal year 1968
REGION FIVE.....	\$52, 130	\$5, 314
Arkansas.....	7, 839	643
Louisiana.....	12, 825	1, 264
New Mexico.....	1, 575	230
Oklahoma.....	7, 233	858
Texas.....	22, 657	2, 319
REGION SIX.....	27, 078	1, 745
Colorado.....	6, 061	364
Iowa.....	2, 604	354
Kansas.....	2, 005	133
Missouri.....	5, 952	265
Nebraska.....	1, 631	6
North Dakota.....	2, 519	219
South Dakota.....	3, 330	181
Wyoming.....	2, 975	222
REGION SEVEN.....	68, 922	3, 990
Arizona.....	3, 510	394
California.....	54, 446	2, 975
Hawaii.....	718	39
Nevada.....	2, 927	224
Utah.....	7, 319	357
American Samoa.....	0	0
Guam.....	0	0
REGION EIGHT.....	16, 428	832
Alaska.....	1, 658	41
Idaho.....	3, 170	208
Montana.....	1, 113	197
Oregon.....	3, 125	105
Washington.....	7, 363	282

¹ Figures may not add to exact totals due to rounding.

76 percent of all counties and more than 94 percent of the larger cities had some stocked public fallout shelters.

There were 5,962 full- or part-time civil defense personnel, paid with the help of Federal matching funds, functioning part of State and local civil defense organizations that are legally an integral part of civil government under the authority of elected officials. Under OCD guidance, these organizations also relied upon many additional State and local government employees and volunteers trained to carry out specific civil defense assignments.

As in past years, the performance readiness of many State and local civil defense organizations was tested in dealing with the effects of peacetime disasters. Major disaster activities in which civil defense played a significant role during fiscal year 1968 included Hurricane Beulah during September 1967, and the collapse of the Silver Bridge over the Ohio River at Kanauga, Ohio, in December 1967. (See app. 1.)

FALLOUT SHELTER

Primary focus in civil defense continues to be the development of a nationwide fallout shelter system through the dual-use of existing structures and the management of this system and supporting emergency systems through maximum use of the existing capabilities of State and local governments. This part of the report describes fiscal year 1968 progress in development of the fallout shelter system. It also covers planning, special surveys, and other activities designed to expand and strengthen the fallout shelter system in each community.

OPERATIONAL GAINS

Public fallout shelter space for 16.3 million additional persons was located during fiscal year 1968, increasing the national inventory to more than 176.5 million surveyed spaces. Operational gains were also made in licensing, marking, and stocking public fallout shelters. At the end of the fiscal year, space had been licensed for 108.9 million persons, marked for 101.1 million, and stocked with supplies sufficient to sustain 52.7 million persons for 14 days or 88.1 million for 8 days, the rated capacity of stocked shelter facilities. A summary of fiscal year 1968 progress is given in table 5.

The National Fallout Shelter Survey, started in September 1961, is the cornerstone of the present civil defense program. All studies and analyses are directed to providing effective protection against fallout radiation for the entire population at work, at home, or in school. Early studies of possible nuclear attack patterns directed at the United States showed fallout shelters to be the least expensive way to save more lives than any other feasible protective measure. The number of persons saved would decrease only slightly as weapons and yield increased. Progress is being made in (1) a continuing nationwide survey to locate public fallout shelter space within existing and new construction, (2) evaluation of existing food and water supplies and sanitary water disposal accommodations, (3) identification of shelter spaces where air circulation could be improved by OCD ventilation equipment, (4) marking and licensing of acceptable shelter space for public use, (5) stocking of licensed shelters with survival supplies, and (6) location and protection factor calculation of shelter in private homes. Succeeding sections of this report present the status of these operations.

TABLE 5.—*Summary of progress in public fallout shelter program, fiscal year 1968*

Program action	Number of facilities (in thousands)				Number of spaces (in millions)			
	End of fiscal year 1967	End of fiscal year 1968	During fiscal year 1968		End of fiscal year 1967	End of fiscal year 1968	During fiscal year 1968	
	Total	Total	Gain	Percent gain	Total	Total	Gain	Percent gain
Located.....	175. 5	189. 1	13. 6	8	160. 2	176. 5	16. 3	10
Licensed.....	100. 5	109. 7	9. 2	9	98. 7	108. 9	10. 2	10
Marked.....	101. 0	107. 5	6. 4	6	92. 7	101. 1	8. 4	9
Stocked.....	83. 0	91. 1	8. 1	10	47. 1	52. 7	5. 6	12
Rated capacity of facilities stocked.....					78. 4	88. 1	10. 3	12

Survey Operations

Some protection from radioactive fallout exists in all structures because building material reduces by varying degrees the amount of radiation to which a person would be exposed. This reduction of radiation intensity results from the amount of structural mass and the distance between the source of radiation outside the building and the person within.

The purpose of a fallout shelter program is to provide enough shielding to reduce radiation doses to non-fatal or non-disabling levels. Public fallout shelters in this program fall into two categories: (1) Those with space for at least 50 persons and a minimum protection factor (Pf) of 40, and (2) those with space for 10 to 50 persons and a Pf of at least 40. Pf expresses the relation between the amounts of radiation received by an unprotected person and by a person inside the shelter. Thus an unprotected person would receive 40 times more radiation than a person at the same location inside a shelter with a Pf of 40. The survey was further expanded in late fiscal year 1967, and continued in fiscal year 1968, to locate fallout protection in structures excluded previously in the basic National Fallout Shelter Survey because they did not meet the minimum criteria of Pf 40. The search for the best available protection has been limited to the southern and southwestern States where few homes have basements.

During fiscal year 1968, survey operations continued to be principally of an updating nature. The operations consisted of adding new facilities to the inventory, deleting those which had been demolished or would no longer qualify as shelter facilities, and adjusting records as required by structural modifications. These

TABLE 6.--FALLOUT SHELTER LOCATED, LICENSED, MARKED, AND STOCKED FISCAL YEAR (FY) 1968^{1/}

(Protection factor of 40 or higher, 50 or more spaces per facility)

Area	L O C A T E D				L I C E N S E D				M A R K E D				S T O C K E D (With General Supplies)							
	Facilities		Spaces (000)2/		Facilities		Spaces (000)2/		Facilities		Spaces (000)2/		Facilities		Spaces (000)2/		Rated Capacity		Stocked Capacity	
	During FY 1968	Cumulative, End of FY 1968	During FY 1968	Cumulative, End of FY 1968	During FY 1968	Cumulative, End of FY 1968	During FY 1968	Cumulative, End of FY 1968	During FY 1968	Cumulative, End of FY 1968	During FY 1968	Cumulative, End of FY 1968	During FY 1968	Cumulative, End of FY 1968	During FY 1968	Cumulative, End of FY 1968	During FY 1968	Cumulative, End of FY 1968	During FY 1968	Cumulative, End of FY 1968
TOTAL.....	13,557	189,053	16,302	176,539	9,257	109,725	10,186	108,883	6,438	107,456	8,389	101,053	8,033	91,075	9,634	88,058	5,682	52,748		
REGION ONE.....	1,371	64,372	1,772	52,881	2,348	34,294	1,995	30,491	953	38,233	1,267	30,694	2,410	28,357	2,473	24,115	1,684	14,665		
Connecticut.....	11	2,889	38	2,231	37	1,914	17	1,655	19	1,549	11	1,297	16	1,670	1	1,281	-3	961		
Maine.....	101	1,019	63	522	192	737	93	440	188	777	96	441	175	617	74	349	63	285		
Massachusetts.....	170	7,191	149	5,613	258	3,918	142	3,059	235	3,775	103	2,936	212	2,757	136	2,223	118	1,422		
New Hampshire.....	24	590	18	290	92	415	45	207	99	398	45	194	48	341	20	172	29	150		
New Jersey.....	-117	7,807	290	6,575	60	4,057	201	3,863	-357	3,772	35	3,783	169	3,109	298	3,207	275	1,782		
New York.....	914	41,610	1,146	35,648	1,354	21,059	1,393	19,964	443	26,174	856	20,964	1,498	18,273	1,856	15,921	1,056	9,364		
Rhode Island.....	108	1,174	54	861	233	907	85	672	320	698	122	529	205	662	56	513	104	354		
Vermont.....	21	375	5	171	30	293	13	143	23	286	11	145	11	267	1	130	4	93		
Puerto Rico.....	139	1,702	9	968	92	981	4	486	-17	791	-10	404	76	648	30	317	39	252		
Virgin Islands.....	0	15	0	2	0	13	0	2	0	13	0	2	0	13	0	2	0	2		
REGION TWO.....	3,806	39,381	4,722	37,786	1,752	21,297	2,245	22,675	2,266	21,453	2,707	21,976	1,227	16,639	1,839	18,336	538	8,709		
Delaware.....	64	748	31	511	41	488	21	405	75	416	28	347	26	457	17	335	13	135		
Dist. of Columbia.....	1,475	5,626	1,434	6,461	340	1,603	596	3,663	330	1,538	579	3,493	81	1,214	467	3,220	29	704		
Kentucky.....	50	1,719	85	2,204	78	1,196	86	1,550	34	1,200	53	1,493	70	1,075	56	1,289	16	945		
Maryland.....	365	2,943	1,174	3,461	136	2,011	208	1,908	251	1,905	311	1,761	121	1,640	153	1,492	64	864		
Ohio.....	360	7,735	287	6,871	226	4,565	310	3,812	24	4,873	87	3,816	211	3,464	137	2,733	49	1,778		
Pennsylvania.....	773	14,852	1,215	14,093	663	8,650	846	8,934	1,083	8,260	1,354	8,437	517	6,699	851	7,370	247	3,122		
Virginia.....	681	4,806	433	3,583	261	2,175	176	2,027	469	2,592	275	2,218	193	1,568	144	1,583	115	881		
West Virginia.....	38	952	62	601	7	609	4	378	0	669	18	411	8	522	11	312	6	281		
REGION THREE.....	1,683	13,430	2,086	14,196	1,021	9,349	974	9,600	474	7,868	457	8,155	691	7,861	645	7,807	438	5,444		
Alabama.....	-12	1,880	88	1,442	99	1,500	124	1,163	43	1,399	26	996	111	1,370	62	1,029	53	829		
Florida.....	581	2,539	1,252	3,875	143	1,316	139	1,802	-5	1,110	14	1,598	60	1,025	111	1,424	47	865		
Georgia.....	271	2,557	155	3,571	244	1,952	135	2,788	161	1,463	202	2,366	162	1,554	202	2,290	90	1,203		
Mississippi.....	44	631	33	425	33	530	29	385	22	534	21	381	33	473	28	369	20	359		
North Carolina.....	444	2,590	372	2,062	272	1,833	262	1,541	92	1,178	53	936	165	1,517	120	1,195	91	910		
South Carolina.....	134	921	39	646	123	680	44	474	118	607	45	417	88	513	40	370	61	320		
Tennessee.....	166	2,059	132	2,087	107	1,460	242	1,398	43	1,503	94	1,411	72	1,331	83	1,081	76	906		
Canal Zone.....	55	253	19	90	0	78	1	50	0	74	0	49	0	78	1	50	0	52		
REGION FOUR.....	1,443	25,445	2,142	26,788	1,144	15,879	1,499	16,528	506	14,339	913	14,167	1,292	14,225	1,819	13,054	830	8,057		
Illinois.....	141	8,385	49	10,307	277	4,873	171	5,785	54	4,155	3	4,612	592	4,210	746	3,784	243	2,183		
Indiana.....	92	2,912	156	2,541	61	1,755	131	1,661	19	1,779	87	1,484	59	1,589	91	1,423	61	1,136		
Michigan.....	271	5,213	906	6,475	92	3,059	369	3,829	-20	2,851	231	3,501	88	2,692	265	3,237	68	1,483		
Minnesota.....	714	4,386	778	4,109	331	2,964	515	3,035	253	2,807	432	2,699	203	2,768	457	2,637	244	1,713		
Wisconsin.....	225	4,549	252	3,356	383	3,228	313	2,218	200	2,747	162	1,871	350	2,966	260	1,973	216	1,543		
REGION FIVE.....	955	9,651	1,216	10,913	580	7,052	1,149	8,185	318	6,453	1,087	7,441	432	6,142	955	7,050	798	4,857		
Arkansas.....	106	1,587	42	913	65	1,259	75	773	65	1,243	38	753	34	1,130	30	666	31	446		
Louisiana.....	96	1,022	81	1,401	16	658	32	864	39	726	44	959	62	602	104	814	218	692		
New Mexico.....	87	651	61	408	35	511	43	328	2	436	9	270	44	506	26	303	32	297		
Oklahoma.....	207	1,723	262	1,553	91	1,379	209	1,287	28	1,337	131	1,227	45	1,338	184	1,215	149	1,020		
Texas.....	459	4,668	769	6,638	373	3,245	791	4,932	184	2,711	865	4,233	247	2,566	610	4,052	369	2,403		
REGION SIX.....	1,760	18,207	1,025	12,498	1,109	11,342	792	8,139	918	10,412	623	7,605	996	8,860	660	6,846	600	4,491		
Colorado.....	401	2,244	254	1,291	267	1,453	229	1,291	209	1,237	151	983	205	1,147	149	1,078	141	881		
Iowa.....	148	2,385	92	1,396	114	1,765	57	1,006	80	1,833	67	1,102	132	1,462	81	829	95	656		
Kansas.....	256	3,081	109	1,834	102	1,946	56	1,347	122	2,082	67	1,405	85	1,551	35	1,141	33	702		
Missouri.....	249	4,539	243	4,904	87	2,201	173	2,743	7	1,958	74	2,584	43	1,624	82	2,264	26	1,000		
Nebraska.....	319	3,378	217	1,389	174	2,023	112	855	166	1,844	134	787	233	1,503	191	786	174	586		
North Dakota.....	19	928	13	419	175	743	96	367	130	504	61	278	188	635	70	303	77	283		
South Dakota.....	282	1,106	75	445	175	831	62	362	200	639	66	307	73	634	33	307	32	252		
Wyoming.....	86	546	22	241	15	380	8	169	4	315	3	159	37	304	20	138	24	132		
REGION SEVEN.....	1,834	12,727	2,811	16,816	754	6,242	1,100	9,796	595	5,010	982	7,911	522	5,157	858	7,834	492	4,187		
Arizona.....	120	699	256	783	62	417	114	445	76	350	145	378	41	357	57	314	23	252		
California.....	1,247	8,767	2,029	14,113	490	4,407	713	8,237	376	3,525	670	6,715	276	3,539	572	6,603	308	3,259		
Hawaii.....	87	570	156	500	65	344	114	354	3	220	21	202	65	276	80	276	31	128		
Nevada.....	81	387	139	397	54	288	96	294	29	162	44	165	60	260	82	250	67</			

operations increased the nationwide shelter inventory by 13,557 facilities, increasing the grand total to 189,053 facilities with an aggregate capacity for about 176.5 million persons. (See tables 5 and 6.)

Special shelter surveys and other techniques were also used to help locate additional shelter space where needed. Results of survey operations were made available to State and local planning officials to help them provide fallout protection for the people in their area of responsibility.

Licensing and Marking Operations

Licensing.—Before marking public fallout shelters and stocking them with survival supplies, the OCD requires that property owners and local government officials sign a Fallout Shelter License or Privilege form. During fiscal year 1968, licenses were signed for 9,257 facilities with an aggregate capacity for about 10.2 million persons. This increased the grand total to 109,725 licensed facilities, with an aggregate capacity for 108.9 million persons. (See tables 5 and 6.)

Local governments are responsible for obtaining these licenses, but upon request of local civil defense officials, survey personnel continued to perform this task during fiscal year 1968. No monetary payment is made to or by the owner of the shelter facility, and he may revoke the license by sending a 90-day notice by registered mail to his local government as well as to the Federal Government.

The license authorizes temporary access by the public to specified shelter space in emergencies in the period immediately before, as well as during and after, an attack. It also authorizes placement and maintenance of shelter signs, storage of shelter provisions in the facility, and inspection by Federal and local government officials. In addition, the license makes the local government responsible for care and maintenance of the shelter provisions, and except for willful damage or bad faith, exempts the owner from these responsibilities.

Marking.—The OCD continued to furnish standard fallout shelter signs for the interior and exterior marking of public fallout shelters meeting the minimum requirements. Posting these signs is primarily the responsibility of State and local governments, but upon request of local governments, shelter survey personnel continued to assist in performing this work and, when practicable, helped in shelter sign maintenance when facilities were revisited for survey updating.

There were 6,438 facilities, with an aggregate capacity for 8.4 million persons, marked with standard fallout shelter signs during fiscal year 1968, making an approximate total of 173,300 exterior and 592,300 interior signs in use. This increased the grand total to 107,456 marked facilities, with an aggregate capacity for 101.1 million persons. (See tables 5 and 6.)

Stocking Operations

The series of actions that result in actual stocking of a specific shelter begins when the owner and local government official sign the shelter license agreement. Based upon this shelter license data, a preprinted requisition for shelter supplies is sent by the DGSC to the local government. When local officials sign and return the requisition, the DGSC sends a shipping document to the appropriate warehouse and the local government. The supplies are then issued by the warehouse as soon as practicable.

Survival supplies were issued to 8,033 facilities during fiscal year 1968, increasing the grand total of stocked facilities to 91,075. The survival supplies issued during the fiscal year would be sufficient to take care of more than 10 million persons for 8 days or almost 6 million for 14 days. At the end of the fiscal year, the cumulative quantity of survival supplies placed in stocked facilities would be sufficient to take care of 88.1 million persons for 8 days, or 52.7 million for 14 days. In addition, during the year, 10,135 shelters were furnished with at least one radiation detection and monitoring kit, increasing the total so equipped to 94,266 facilities. As of the end of the fiscal year, the capacity of shelters with radef kits showed a cumulative total of 91.5 million persons.

An OCD objective is to assure that survival supplies available to each licensed public fallout shelter would be sufficient to take care of shelter occupants for a 14-day period. The number of shelter occupants in each case is the rated capacity of the shelter; i.e., the number of persons for whom a shelter is capable of providing protected space, as determined by the survey. Shelter occupants in many places would have access to water, food, and medical supplies normally available in buildings where shelters are located. These and other survival assets, such as sewage facilities, are important in determining the amount and kind of supplies issued to each shelter.

Many public fallout shelters have been stocked for 100 percent of their rated shelter occupant capacity. Shelter spaces stocked with federally procured supplies during fiscal year 1968 averaged 60 percent of the rated capacity of the facilities stocked.

The survival supplies placed in license public fallout shelters are food, sanitation and medical supplies, water storage containers, and radiation detection equipment. These supplies, described in appendix 2, were developed and procured by the Federal Government. An important specification was that they remain usable after long periods of storage. They are adequate to take care of normally healthy persons while in shelters and to enable them to resume productive activities upon emergence.

Status of operations.—Food, sanitation kits, and medical kits, procured and delivered to Federal warehouses since the inception of the program in fiscal year 1962, would be sufficient to take care of 63 million shelter occupants for 2 weeks. Water containers were procured for only 50 million since trapped water is available in many shelters for emergency use. No additional procurement of general shelter supplies was initiated during fiscal years 1965 through 1968, pending distribution of stocks procured. About 9 percent of these supplies were placed in shelters during fiscal year 1968; 75 percent were placed in shelters in prior years, and, at the end of fiscal year 1968, the remaining 16 percent, for use in filling requisitions, were at warehouses. (See fig. 4.) Radiological kits had been furnished to 94,266 shelters by yearend. During fiscal year 1968, the average cost to the Federal Government of shelter stocking, including associated warehousing and transportation, continued to be approximately \$2.43 per shelter space.

By fiscal yearend, 779 ventilation kits had been placed in shelters under the pilot program. With the 1,462 ventilation kits previously placed, and the 159 kits issued for non-shelter use, such as service testing and evaluation, training, and shelter occupancy studies, this completed the pilot program. (See app. 2.) By placing these kits in inadequately ventilated public shelters, the shelter occupant capacity was increased by a total of 202,000 spaces.

Civil Defense Quality Check Program.—Initiated during fiscal year 1967, the Civil Defense Quality Check Program was well underway during fiscal year 1968. The purpose of this program is to inspect fallout shelter supplies on a scientific sampling basis and obtain data relative to the serviceability and operational readiness of these supplies.

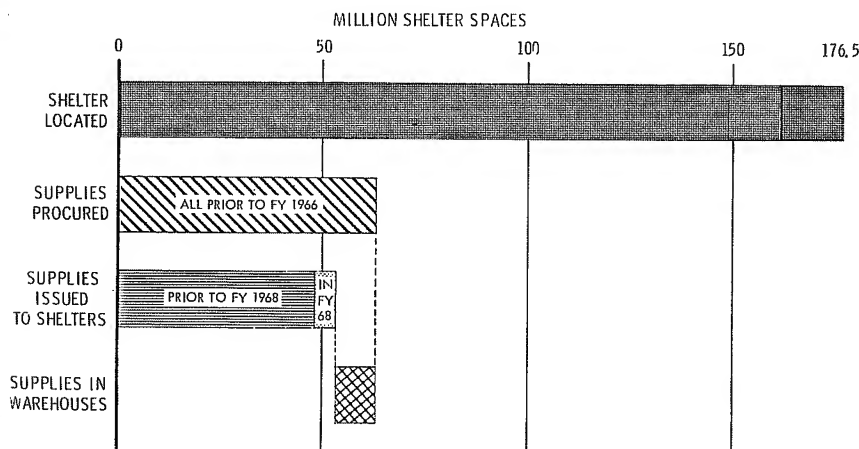


Figure 4.—Summary of shelter stocking operations, end of fiscal year 1968.

The program was tested under a four-phase schedule of execution.

The inspection concepts and proposed inspection and reporting procedures were evaluated under field conditions during fiscal year 1967 (Phase 1) before being published and distributed in the field. A series of training seminars for personnel of the Veterinary Services, who conducted the inspections, was held by the Defense Supply Agency, which is responsible for the program. Inspections of military installations (Phase 2) were completed during the early part of fiscal year 1968, and inspections were conducted in Federal buildings (Phase 3), and then in civilian-owned facilities (Phase 4) during the fiscal year.

Preliminary findings from inspections conducted during the year indicate that the general condition of the supplies is satisfactory. Samples of medicinal item in the medical kits, and food and water in civil defense storage containers were collected for laboratory testing to determine their condition and suitability for survival purposes. Results of this testing program were not available at fiscal yearend. A total of 1,892 quality check inspection reports were completed by the end of the fiscal year; 523 inspections of shelters at military installations, 710 shelters in Federal buildings, and 659 civilian-owned buildings. Arrangements were made to convert the reports into punched cards for further processing and analysis, using automatic data processing equipment.

Plans have been initiated to conduct a quality check inspection of 6,000 shelters during fiscal year 1969. A first step toward accomplishing this goal was a sample selection of 836 shelters located throughout the Nation. Plans have been coordinated with the OCD regional offices and various civil defense organizations, and instructions have been issued to the veterinary personnel who will conduct the initial inspections.

Product Development Program.—Product improvement involves the monitoring and test evaluation of commercial products as well as OCD and other Government agencies' research items for possible use in the shelter stocking program. Before new stock or substitutes for the standard OCD supplies are adopted, prototype quantities of these new products must be procured, tested, and evaluated. Development efforts concern improved packaging and stability, increased storage life, and substitute items for the stocking program. The OCD has also conducted a review of the water storage requirements in shelters and the various problems associated with this requirement. The various items which are presently included in the search for improved shelter items are:

1. Blown mold plastic liners for 17½ gallon steel drums.
2. Round bottom film liners for 17½ gallon steel drums.
3. Foldable commodes of resistant fiberboard with inner and outer polyethylene bags.

4. Nestable steel water drums, 17½ and 10½ gallon capacity.
5. Five-gallon plastic water containers with cap closures and spigots.
6. Two five-gallon plastic containers packaged into a single water-resistant fiberboard box.
7. Fifteen-gallon plastic drums (commercial items).
8. Pillow-type tanks (military items).

A program was initiated to procure and issue special protective devices for supplies to be kept in mines, caves, and tunnels where storage conditions are less favorable due to humidity, moisture, and dust. The protective devices are issued to special facilities where additional protection is required to insure continued serviceability of supplies.

Protective devices consist of:

1. A highly water-resistant, impregnated fiberboard box, with sleeve, used to overpack each food case.
2. A highly water-resistant, impregnated fiberboard box used to over-pack each large medical kit.
3. A protective bag, fabricated from polyethylene film, which is used to enclose one each: sanitation kit, water container, small medical kit, and radef kit.
4. Polyethylene film, in rolls, used to cover stacks of supplies in shelters stocking 1,000 or more spaces.
5. Special pallets to provide a firm stocking platform and to keep supplies from direct contact with the facility floor surface.

Distribution of the protective devices is made from warehouses at Edison, N.J., Memphis, Tenn., LaPorte, Ind., Kansas City, Mo., Sacramento, Calif., and Seattle, Wash. Protective devices have been issued to 29 caves and mines in nine States providing protection for a total of 160,494 spaces. Additional supplies are available for issue.

Operational procedures.—During fiscal year 1968, supply operations were limited primarily to the distribution of supplies from warehouses to public fallout shelters. All supplies were distributed through Department of Defense (DoD) and General Services Administration (GSA) warehouse facilities. The Defense General Supply Center (DGSC) at Richmond, Va., a field facility of the DSA, continued as the national inventory control point for the distribution of shelter supplies.

By the end of the fiscal year, 16 DoD and nine GSA warehouses were serving as distribution points to local governments. During the year, stocks at six warehouses were substantially reduced, and the civil defense supply activities were discontinued after their geographic area missions had been reassigned to other warehouses.

These reassignments reduced future warehousing costs, but the potential savings are offset by an increase in the number of civil defense organizations requiring transportation of supplies at Federal expense for shelter stocking. The Federal Government pays for transportation of supplies to local central delivery points or to shelters being stocked for more than 1,000 persons, if more than 50 percent of the population of the county are more than 25 air-miles from the warehouse. For shorter distances, local governments provide transportation for pick-up and delivery of shelter supplies. Local governments are responsible for placing the supplies in shelters and for future care, inspection, and maintenance of these supplies.

According to available data, shelter supplies placed in public fallout shelters remain relatively secure. At the end of the fiscal year, requisitions for, and issuance of replacements for losses amounted to less than seven-tenths of one percent of the total of all shelter supplies issued since the beginning of the program in fiscal year 1962. This included replacements necessitated by losses from theft, fire, natural disaster, and all other causes. Reported losses caused by theft and vandalism amounted to only slightly more than one-tenth of one percent.

COMMUNITY SHELTER PLANNING

The OCD Community Shelter Planning (CSP) program is the foundation of local emergency readiness and the basis for development of practical procedures in each jurisdiction for efficient use of the best available fallout protection in the event of attack, for informing each citizen, and for preparing each department of local government to support the plan and meet responsibilities in a major disaster.

Adequate shelter will save many lives in the event of attack. The Community Shelter Plan enables a local government to help people survive nuclear attack by answering the questions, "Where do I go?" and "What do I do?" Under the plan, individuals are allocated to specific public shelters, thus insuring optimum use of the best shelter. This information is made public by a printed Community Shelter Plan which includes maps and guidance. The document is updated when shelter changes and population shifts make it necessary. Those people for whom public shelter is not available are provided information about constructing or improving shelter.

In large communities, OCD, through the U.S. Army Corps of Engineers, contracts with local governments or planning agencies for the development of community shelter plans. At the end of fiscal year 1968, a cumulative total of 194 contracts had been negotiated.

These contracts provide for the development of emergency shelter use plans in 244 counties with a population of nearly 50 million people.

The Federal Government makes funds available to obtain the services of a professional planner who serves as State CSP Officer (CSPOS). The CSPOS gives technical assistance to local non-urban governments in small communities where shelter allocation and movement to shelter are uncomplicated, in the development of their shelter plans.

Forty-six State CSP Officer contracts were in effect at fiscal yearend. Rhode Island, being an urban State, has no CSPOS, but it is covered by a single Statewide CSP contract. By the end of fiscal year 1968, a cumulative total of 481 smaller communities with a population of nearly 11 million persons had started community shelter plans.

HOME FALLOUT PROTECTION SURVEY

After active development and testing for several years, the Home Fallout Protection Survey (HFPS) was first deployed in Rhode Island in early 1966. Using Bureau of the Census techniques, the survey collects data from householders to identify and inventory the amount and quality of fallout protected space in home basements. The identification of fallout protection in homes is of significant value to the householder as well as to community shelter planners, as a shortage of acceptable public fallout shelter exists, particularly in residential areas, in many parts of the country. Technical aspects of the program were developed in close cooperation with the Subcommittee on Radiation Shielding of the Advisory Committee on Civil Defense, National Academy of Sciences.

Under OCD sponsorship, the Bureau of the Census conducts the survey by mailing a questionnaire to householders in one-, two-, and three-family homes. These are filled out and returned to the Census Bureau for computation of protection factors in each home with a basement. Usually, places of less than 10,000 population, where addresses are not available, are covered by enumerators. The information on each home is confidential to the householder and the Census Bureau. For the majority of householders, the survey provides information for the first time on whether or not fallout shelter protection exists in the basements of their homes.

Every respondent whose home has a basement is mailed a specially prepared booklet titled "Fallout Protection for Homes with Basements," H-12, which provides information on the degree of fallout protection in the basement and means of improving this protection.

If the home does not have the minimum protection suggested, Pf-40, the family is provided several alternatives for improvement. The alternatives include actions which could be taken in a relatively short time during a period of increased tension. In addition, a return card is included for requesting detailed fallout protection construction plans and a list of materials with approximate costs.

Families responding, in homes without basements, are furnished an emergency information booklet titled "In Time of Emergency," H-14, and are advised to seek public shelter in an emergency and contact their local civil defense authorities for additional information.

Statistical summaries of home fallout protection are furnished to the State and local governments for use in local shelter planning. The total cost averages \$1 per home covered in the survey.

By the end of fiscal year 1968, surveys had been completed in the States of Rhode Island, Minnesota, Maine, Utah, Nebraska, Iowa, Kansas, West Virginia, Wyoming, Vermont, New Hampshire, Idaho, Colorado, Washington, Wisconsin, Montana, North Dakota, South Dakota, Alaska, Michigan, Oregon, and the Counties of Nassau and Suffolk in New York.

Toward the end of fiscal year 1968, the HFPS was begun in Connecticut, Massachusetts, Delaware, Maryland, Virginia, and the District of Columbia. For all previous surveys and these surveys which were completed after the close of the fiscal year, a total of 1.8 million Pf-40 shelter spaces were identified for occupants of 496,161 homes, and Pf 20-39 protection for 28.0 million occupants of 8.1 million homes. The majority of homes with Pf 20-39 protection could readily be improved to Pf-40 or better. (See table 7.)

DIRECT MAIL SHELTER DEVELOPMENT SYSTEM

Administered by the OCD, the Direct Mail Shelter Development System (DMSDS) is a systematic procedure for contacting owners and architects of specific new buildings and offering the technical assistance for incorporating fallout protection in the design of the project. The DMSDS uses direct mail techniques combined with personal contact by State or local government authorities and University Service Centers. The State or local authorities confer with the building owners; the Professional Advisory Service Centers assist the project designers. Contacts are made early in the design phase while there is still time to incorporate fallout protection into the building design at little or no extra cost through slanting techniques.

TABLE 7.—Home Fallout Protection Surveys, through fiscal year 1968

[In thousands, except percents]

Completed States	Homes covered	Mail questionnaires			Homes covered by enumerators	Shelter space identified ¹	
		Delivered to homes	Mailed back	Percent response		PF 40 or higher	PF 20-39 ²
Total.....	15, 646	8, 696	6, 448	74	6, 928	1, 817	28, 022
Rhode Island.....	223	223	162	73	(13)	66	472
Minnesota.....	934	420	358	85	514	76	2, 302
Maine.....	251	251	203	81	-----	44	501
Utah.....	249	149	114	77	100	8	441
Nebraska.....	420	151	118	78	269	16	766
Iowa.....	816	301	225	75	515	37	1, 780
Kansas.....	661	335	249	74	326	30	833
West Virginia.....	505	141	101	72	364	24	352
Colorado.....	532	349	265	77	183	34	779
Wyoming.....	87	35	26	74	53	2	132
Idaho.....	184	55	43	78	129	4	288
New Hampshire.....	188	67	48	71	121	23	447
Vermont.....	112	18	13	72	94	12	289
Washington.....	847	493	381	77	355	22	889
Wisconsin.....	1, 155	583	464	80	571	115	3, 066
Montana.....	186	66	49	74	120	7	332
South Dakota.....	181	47	38	81	134	4	415
North Dakota.....	160	43	33	77	117	3	420
Alaska*.....	36	36	26	72	-----	0. 5	26
Nassau-Suffolk (New York).....	612	466	365	77	146	97	1, 340
Michigan.....	2, 299	1, 453	1, 099	76	846	222	4, 619
Oregon.....	549	245	193	79	303	11	419
Virginia ³	1, 128	518	392	76	610	81	855
Maryland ³	886	607	418	69	279	290	1, 245
Delaware ³	131	131	94	72	-----	43	162
District of Columbia ³	122	122	71	58	-----	62	113
Connecticut ³	745	484	333	69	261	142	1, 606
Massachusetts ³	1, 425	907	567	63	518	341	3, 133

*Fairbanks excluded because of the flood there, a major natural disaster.

¹ Based on number of occupants.² 97.3 percent are improvable at low cost to PF-40.³ Completed after close of fiscal year.

Under the DMSDS procedure, a letter is sent to each building owner of a selected project, urging him to have his architect examine the possibility of including fallout protection in the building. At the same time, another letter is sent to the architect informing him of the technical assistance available from University Service Centers for incorporating fallout protection in the design. The State Civil Defense

Directors are kept apprised of projects selected in their State so that they (or the local Civil Defense official) can follow up with the building owner. This is usually accomplished through a personal visit to the building owner to discuss the vital importance of designing fallout protection into the new building to provide needed shelter for the community. (See figs. 5 and 5a.)

In each of the States serviced by DMSDS, a Professional Advisory Service Center exists to provide technical guidance and assistance to architects wishing to apply design slanting techniques to give maximum fallout protection in a specific project. In other cases, architects will be able to call on their own experience or that of a staff member if either is one of more than 16,500 fallout shelter analysts who have successfully completed the radiation shielding design and analysis course.

During fiscal year 1968, DMSDS was conducted as a test in seven States—Arizona, Florida, Louisiana, Massachusetts, Tennessee, Texas, and Wisconsin. The test included developing procedures for reaching owners and architects, for gaining owner and architect response, for determining advisory service effectiveness, and for measuring potential versus actual shelter gain and system effectiveness.

Test Results.—During fiscal year 1968, 5,226 projects were selected for mailing. Architects of 1,374 projects responded, 26 percent of the project mailing. Architects for 818 projects were contacted by the seven Professional Advisory Centers.

Selection of the building project for DMSDS purposes involved dollar valuations in excess of \$100,000 if the building had a basement, and \$200,000 if the building had no basement. However, all schools (with or without basements) having a dollar valuation of \$100,000 or more were selected. The average dollar valuation of the projects selected was \$1,355,000.

Results to date indicate that the average “slanted” building can yield 525 spaces in addition to 325 spaces inherent in the building at a cost to the building owners of one-half of one percent of the total construction cost of the buildings.

Based on these test results, arrangements were made to expand the program in fiscal year 1969 to 37 States. Approximately 1,500 projects per month are expected to be handled under the expanded DMSDS program. In addition to the seven original test States, DMSDS will be deployed in Alabama, Alaska, California, Colorado, Delaware, Georgia, Idaho, Iowa, Kansas, Kentucky, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, North Dakota, Oklahoma, Oregon, Pennsylvania, South Dakota, Vermont, Virginia, Washington, West Virginia, and Wyoming.

OTHER SURVEYS AND DESIGN TECHNIQUES

During the 1967-1968 biennial sessions of the State Legislatures, a number of measures relating to shelter were considered. At least 43 bills were introduced in 22 legislatures and, as of June 30, 1968, nine had been enacted into law in seven States. These authorized or encouraged the use of slanting techniques in specified types of public buildings such as State and local general purpose buildings, or schools. States whose legislatures favorably acted upon shelter measures included Connecticut, Florida, Georgia, Oklahoma, Rhode Island, South Dakota, and Tennessee.

The OCD relies upon the use of automatic data processing for analyses of building designs, making rapid identification and integration of desired protective features possible in the early stages of design development. Cost-index curves, as well as data tables, are made available for estimating the cost of these features during design and for budgeting construction programs.

Case studies also are made to show the greatest amount of protection obtainable without additional or with very little extra cost and to provide typical cost estimates for incorporating protective features meeting OCD criteria.

In addition to the Home Fallout Protection Survey and the Direct Mail Shelter Development Survey described in the preceding sections of this report, other surveys and design techniques were used to locate or develop additional protective space in areas with unfilled requirements for standard fallout shelters. These surveys and techniques are discussed in the following sections.

Best Available Shelter Survey (BASS).—This survey located facilities which afford better fallout protection than homes but do not meet the OCD minimum criteria for public fallout shelters. The protection factors are generally in the 10-39 range.

During fiscal year 1968, pilot projects were started in Mississippi, Oklahoma, Arkansas, and South Carolina. In three of these pilot studies, facilities with protection factors of 5-9 were also surveyed, but Arkansas was limited to Pf-10. More than 2,000 facilities were surveyed at an average unit cost of about \$50.

All survey work was conducted in counties where Community Shelter Plans were being prepared or were scheduled. New contracts were awarded at the end of fiscal year 1968 to Oklahoma, Mississippi, and Florida. Survey effort was again limited to counties in which CSP's were scheduled. In these contracts, surveys were limited to facilities with Pf-10 or better.

HOW DMSDS OPERATES

(After Step 1, activities do not necessarily occur in sequence shown.)

STEP 1

- THE SYSTEM PROVIDES NEW CONSTRUCTION DATA - - -
 - A. PROJECT NAME, LOCATION, USE CLASS, DOLLAR VALUATION, STAGE OF DEVELOPMENT
 - B. NAME AND ADDRESS OF OWNER AND ARCHITECT
 - C. DATA CONCERNING BASEMENT, ROOF, FRAME, FLOOR, EXTERIOR WALL, NUMBER OF STORIES, FLOOR AREA, ETC.
- BASED ON THIS INFORMATION, PERSONALIZED LETTERS ARE SENT TO OWNERS AND ARCHITECTS. NOTICES TO STATE CIVIL DEFENSE DIRECTORS FOR ASSIGNMENT OF FOLLOW-UP ACTION ARE MAILED

STEP 2

- STATE CD DECIDES TO CONTACT OWNER OR FORWARDS NOTICE TO RESPONSIBLE CD WHERE NEW BUILDING IS TO BE CONSTRUCTED
- FOLLOW-UP WITH OWNERS BY RESPONSIBLE CD IS A FACE-TO-FACE EFFORT, WHERE POSSIBLE. CHAMBERS OF COMMERCE, MAYORS, OR OTHER OFFICIALS MAY HELP CIVIL DEFENSE OFFICIALS BY WRITING LETTERS TO ABSENTEE OWNERS.

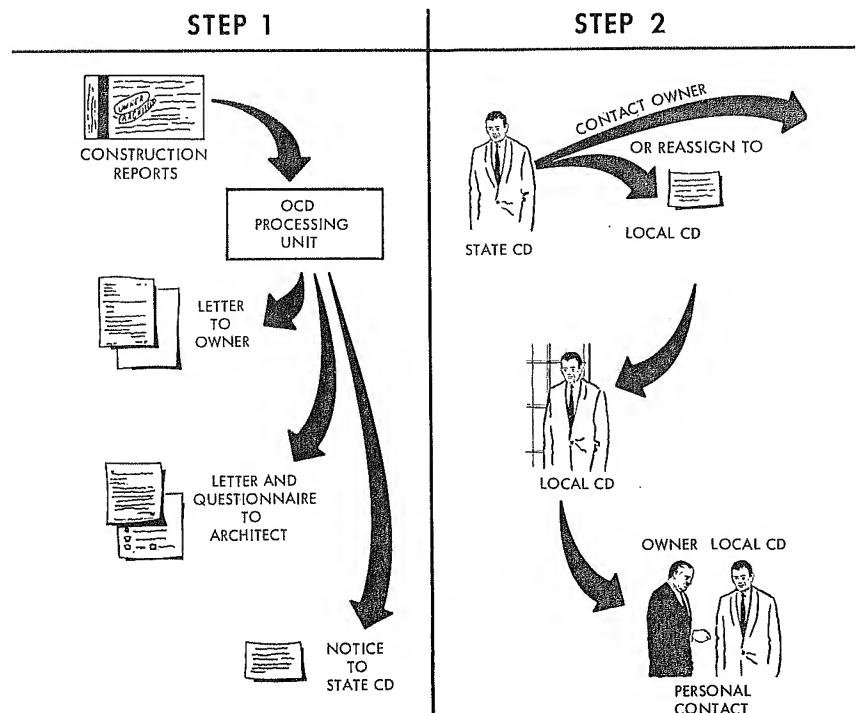


Figure 5.—How the Direct Mail Shelter Development System Operates, Steps 1 and 2.

STEP 3

- OWNER CONTACTS HIS ARCHITECT
- THE ARCHITECT FILLS OUT THE QUESTIONNAIRE (ATTACHED TO HIS LETTER) INDICATING HIS REQUIREMENT FOR TECHNICAL ASSISTANCE AND MAILS IT TO THE ASSIGNED UNIVERSITY SERVICE CENTER. THE QUESTIONNAIRE IS RETURNED EVEN IF NO TECHNICAL ASSISTANCE IS REQUIRED.
- THE UNIVERSITY SERVICE CENTER ASSIGNS A SHELTER ANALYSIS ADVISOR

STEP 4

- SHELTER ANALYSIS ADVISOR CONTACTS ARCHITECT FOR APPOINTMENT
- SHELTER ANALYST ADVISES ARCHITECT ON DESIGN SLANTING TECHNIQUES AND FILES REPORTS
- FROM INFORMATION OBTAINED DURING THE FIRST FOUR STEPS, THE PROCESSING UNIT GENERATES PERIODIC PROJECT STATUS REPORTS

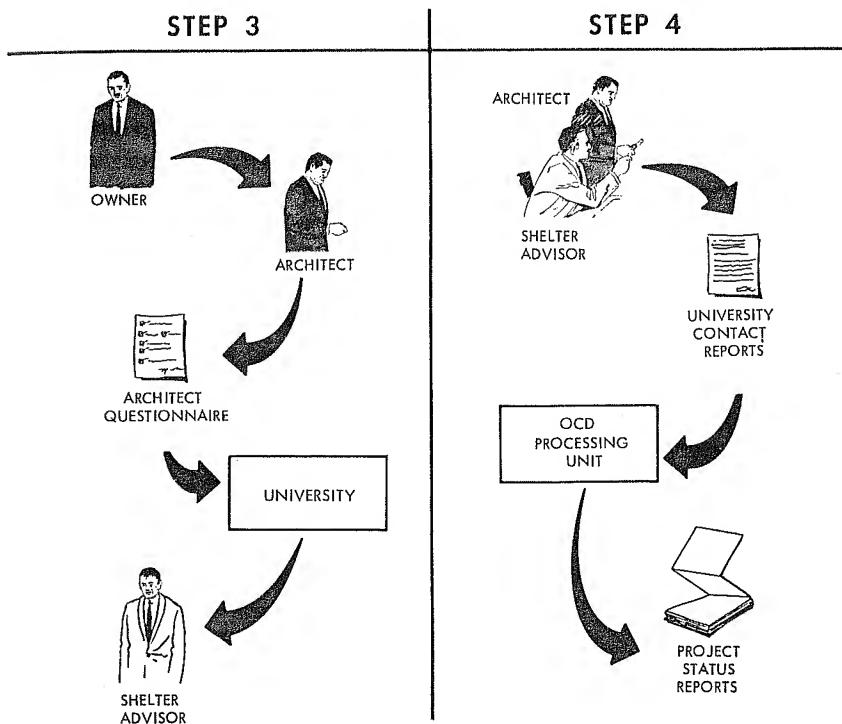


Figure 5a.—How the Direct Mail Shelter Development System Operates, Steps 3 and 4.

In all new contracts, a documented quality control procedure has been implemented.

Federal buildings.—The objective of this program is to make “slanting” for maximum fallout radiation protection a standard practice in the design of all Federal construction. Professional consulting services for this purpose are available for Federal agencies responsible for the design and construction of new buildings. These services provide a review of requirements and architectural designs to determine the need for fallout protection in a proposed building, the feasibility of providing it economically, and the adequacy of funds requested for it.

Fiscal year 1968 appropriations authorized the incorporation of fallout protection in 15 specific Federal buildings. These buildings, as well as 22 Federal buildings for which similar appropriations were authorized for fiscal year 1967, were included in those covered by the OCD advisory service on slanting techniques.

Schools.—Since one-quarter of the population attends school, protection of this group is a vital concern. Many new schools are being built, particularly in suburban areas where the National Fallout Shelter Survey has indicated a shortage of available shelter spaces. The United States Office of Education, Department of Health, Education, and Welfare, agreed with OCD on a program to encourage State and local school construction officials to use design techniques to increase fallout protection in new school construction. This effort was supported by an assessment of State Practices in School Construction by the Council of Educational Facility Planners.

During fiscal year 1968, the National Commission on Safety Education completed a project in Los Angeles, Calif., for locating, analyzing, and utilizing shelter in existing schools. The commission also developed procedures for using the services of qualified shelter analysts.

Military construction.—The Secretary of Defense has issued a directive providing guidance on objectives, policies, and criteria for determining the nature of fallout shelter requirements, and for developing a plan for fallout shelter programs on DoD installations.

Section 610 of the Military Construction Act of 1967, as amended, provides that construction authorized under the annual military construction acts is to be designed to maximize public fallout protection where such can be done at little added cost and without impairing the purpose for which the construction is authorized.

Thus the Department is exercising leadership in showing that fallout protection should be considered an important part of all new construction.

PROFESSIONAL SUPPORT OF ARCHITECTS AND ENGINEERS

Building committees, property owners, and others initiating construction projects rely heavily on the Nation's architects and engineers for design. It is of prime importance, therefore, to create sound professional competence within these professions to plan for and design effective shelters at little or no additional construction cost. The architect and engineer development program provides practicing architects and engineers with appropriate technical knowledge and capabilities so that effective, low-cost shelters are incorporated into on-going design projects.

The ultimate goal is to qualify one or more architects or engineers in fallout shelter analysis in each design firm and government agency employing such professionals. Another goal is the qualification of one or more professors to teach appropriate courses in shielding analysis and/or other phases of protective construction as a part of the curriculum in architectural or engineering departments of all colleges and universities. Major efforts to accomplish these goals in fiscal year 1968 are described in this section of the report.

Professional development.—Through 186 classes conducted in Fallout Shelter Analysis during fiscal year 1968, 2,745 architects and engineers completed the course, increasing the cumulative number of fallout shelter analysts to more than 16,500. (See fig. 6.) The OCD keeps them informed by mail on new technical data as it becomes available. The names of qualified analysts are published in the National Directory of Qualified Fallout Shelter Analysts, FG-F-1.3.

The Fallout Shelter Analysis course was taught at several universities and professional schools on a semester basis, as well as by traveling instructor teams. It was also taught by the U.S. Navy Civil Engineering Officers' School at Port Hueneme, Calif., and the U.S. Army Engineer School, Fort Belvoir, Va. Several other courses were offered during the year, including one in Protective Construction given 27 times, with a total of 586 participants. The course was an extension of the Fallout Shelter Analysis course, with emphasis on structural dynamics and the immediate effects to structures of a nuclear detonation. A course in Environmental Engineering was offered in 31 classes, attended by 667 persons. This course covers the unique problems of shelter environment control and the procedures for solving them.

There were 175 institutions that have cooperated in having selected architectural and engineering faculty attend special OCD-sponsored programs to become highly qualified in nuclear defense design tech-

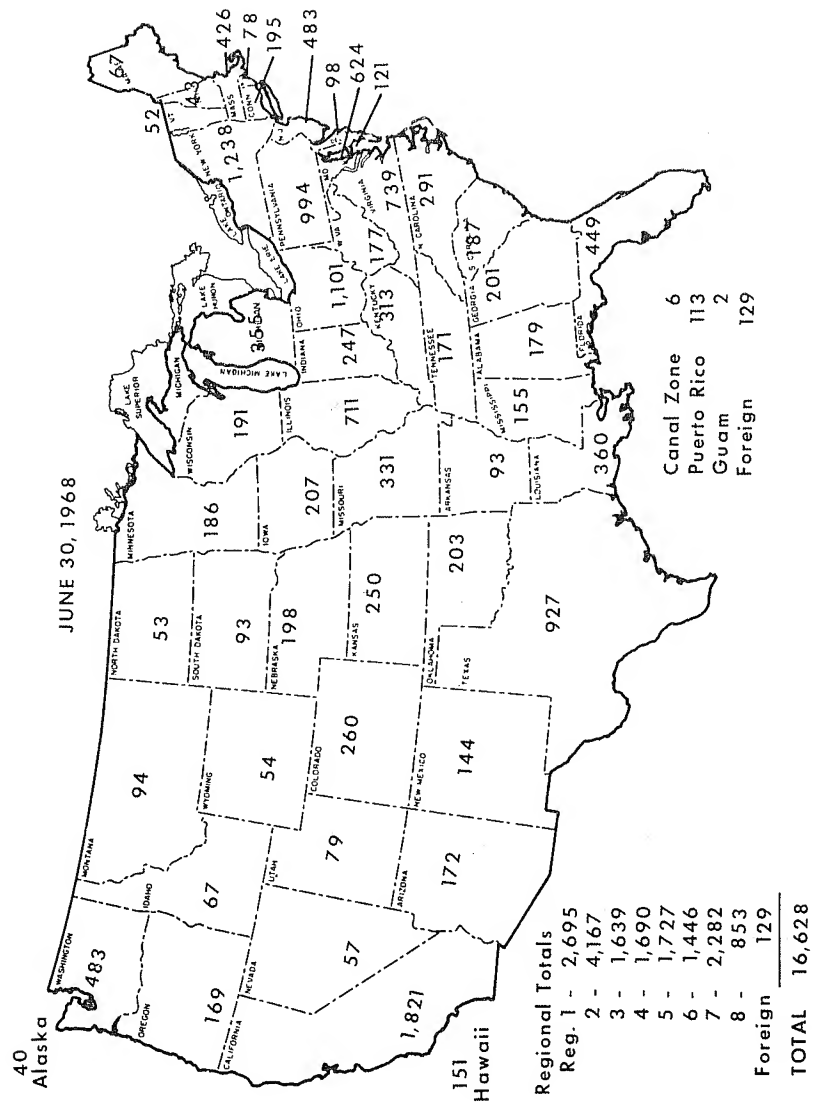


Figure 6.—Geographical distribution of qualified fallout shelter analysts.

nology. As of June 30, 1968, 584 qualified instructors were available to OCD for conduct of professional development courses.

Architectural and engineering development centers.—Established during fiscal year 1965, these centers, one in each of the eight OCD regions, provide planners, architects, and engineers with information on the latest techniques for providing protection from fallout.

Located at the Universities of Colorado, Florida, and Washington, and at Pennsylvania State University, Purdue University, San Jose State College, Texas Agricultural and Mechanical University, and Worcester Polytechnic Institute, these centers offer programs integrating the technical capabilities of the institution to serve civil defense requirements. The centers are strategically located, so that each OCD region has one highly qualified institution as a base for dissemination of civil defense technical information to practicing architects, engineers, faculty, and students in its area.

University projects.—During fiscal year 1968, new Professional Advisory Service Centers were established at eight colleges and universities in a continuing effort to establish a nationwide advisory service center program. The new Professional Advisory Service Centers are located at Georgia Institute of Technology, Auburn University, Notre Dame University, the Universities of Mississippi, Minnesota, Kentucky, and Maryland, and the Rhode Island School of Design. Forty-two States now have Professional Advisory Service Centers.

Contracts were renewed to continue advisory services with Dartmouth College, N.H., Manhattan College, N.Y., and the Universities of Ohio, South Carolina, Hawaii, Utah and Kentucky. Advisory Services were also performed by the seven universities on projects originated through the Direct Mail Shelter Development System or through other sources.

Requests for professional advisory services by architectural and engineering firms resulted in the assignment of 1,685 tasks during the fiscal year, and 32 Professional Advisory Service Centers completed 1,031 tasks. Plan analysis and guidance services were given on 773 construction projects for incorporating slanting techniques to improve fallout shelter. These services resulted in recommendations which, if adopted, would add 140,000 shelter spaces in the design of these facilities. The Advisory Services also identified an additional 92,000 shelter spaces which were inherent in the design of the structures. A total of 255 lectures, seminars, and workshops were given by the Professional Advisory Service Centers in addition to plan analysis and guidance services. These lectures and seminars emphasize to architects, engineers, school boards, and State and local officials the need for incorporating shelter and the importance of the National

Fallout Shelter Program. Through these lectures, a "fallout shelter consciousness" within the community is developed to make the philosophy of slanting for shelter a normal construction practice. The achievements to date are reflected in the increasing number of architects and engineers requesting guidance in incorporating shelter.

The Professional Advisory Service Centers play a key role in implementing the expanded DMSDS program scheduled for fiscal year 1969.

Student fellowships.—The Graduate Student Development Fellowship Program was established during fiscal year 1966 by OCD in cooperation with the American Society for Engineering Education. The program aims at increasing the number of architectural and engineering faculty with an interest, knowledge, and expertise in civil defense subjects, by reaching young professionals early in their careers. Sponsorships at this level of instruction enable OCD to inform students with research and teaching potential of the needs of civil defense. Ultimately, talent and interest in the teaching and further study of subjects of OCD interest are encouraged. The fellowship program enables graduate students of architecture, engineering, urban design, applied mathematics, and related nuclear sciences to pursue courses of instruction in areas of radiation shielding or architectural studies related to radiation protection. The OCD Fellows study under the guidance of faculty members certified by the DoD as qualified instructors of Fallout Shelter Analysis. The instructors help students select courses that enable them to pursue careers in their chosen specialties and, at the same time, provide a solid foundation for further civil defense-related research and study.

By fiscal yearend, a total of 70 fellowships for students in 49 universities had been authorized and awarded since the program began in July 1966. Applications for fellowships had been received from 120 institutions through the 1968–1969 academic year. There are, in addition, 37 fellowships authorized for the 1969 academic year. Seven of these grants support students working toward Ph. D. degrees. The remaining students are working toward Master's degrees. Two candidates have completed the requirements toward the Ph. D. degree. The fields of interest include architecture, and civil, electrical, mechanical, and nuclear engineering.

Faculty development.—A total of 108 faculty members from 90 universities, colleges, institutes, and service schools participated in summer institutes during fiscal year 1968. This increased to 175 the number of institutions eligible to conduct fallout shelter analysis courses and related activities for architects, engineers, faculty members, and students. The number of qualified instructors throughout the country was increased to 584.

The faculty development program is administered for OCD under contract, by the American Society for Engineering Education, which is responsible for arranging for the programs through subcontracts with qualified universities. During the summer of 1967, institutes on Nuclear Defense Design were conducted by the Universities of Puerto Rico, Washington, and Wisconsin and by Kansas and Pennsylvania State Universities.

Technical publications.—A total of 54 technical publications on protective construction have been distributed, and eight new technical publications were prepared during the fiscal year for distribution early in fiscal year 1969. These include manuals, guides, technical memoranda, and reports. In addition, six publications were revised, brought up-to-date, and reprinted. The "Directory of Architects and Engineers Consulting Firms with Certified Fallout Shelter Analysts" was updated.

Collection of information on projects incorporating shelter for use in preparing brochures, reports, exhibits, and other promotion activities was continued in fiscal year 1968. Qualified instructors contact architectural and engineering firms engaged in the design of buildings incorporating fallout shelter for the purpose of gathering data, photographs, and other information useful in publicity.

During fiscal year 1968, Worcester Polytechnic Institute revised "Shelter Design and Analysis," TR-20 (Vol. 1), a publication for fallout shelter analysts and instructors in fallout shelter analysis. The institute developed a new, quick method of fallout shelter analysis and a "Fallout Shelter Analysts Instructor's Guide." A catalogue of slides and a publication illustrating the slides were developed by Pennsylvania State University for use by fallout shelter analysis instructors and other interested persons. In addition, Pennsylvania State University continued work on a computer data retrieval system during the fiscal year. The University of Florida completed a publication titled "Environmental Engineering for Fallout Shelters," TR-20 (Vol. 3), to be used by fallout shelter analysts and instructors in Environmental Engineering classes. Purdue University completed a "Mechanical Equipment for Shelters" report and is developing an unclassified report on "Electromagnetic Pulse and Neutron Transport." Texas Agriculture and Mechanical University is working on a report on "Effects of Radiation on Man—Dose vs. Time," and in addition, is developing low-cost family shelters for homes without basements. A report titled "Postattack Recovery," is being completed by Colorado University. San Jose State College is preparing reports on the subjects of Water Supply and Pollution Control and Civil Defense Aspects of Water Supply and Pollution Control, which were nearing completion by the

end of the fiscal year. All eight Architectural and Engineering Development Centers are collaborating in the preparation of an "Architect and Engineer Shelter Design Handbook," with San Jose State College as project coordinator. The University of Washington is serving as coordinator in the development of a "Protective Construction" textbook, also collaborated by all eight Architectural and Engineering Development Centers.

Honor Awards.—The American Institute of Architects continued an awards program for OCD during fiscal year 1968. This program recognizes examples of good architecture recently completed incorporating dual-use fallout shelter. Results of the 1966 Awards Program were published in a brochure titled "Buildings with Shelter." The brochure was disseminated to architects, engineers, and other interested persons throughout the Nation. In addition, production was begun on an architectural film of the results of the program for use by the American Institute of Architects. A contract was awarded to the American Institute of Architects for a second awards program in fiscal year 1969. These awards programs further demonstrate that buildings with shelter can be designed without adversely affecting their function, appearance, or cost.

ADVISORY COMMITTEE ON THE DESIGN AND CONSTRUCTION OF PUBLIC FALLOUT SHELTERS

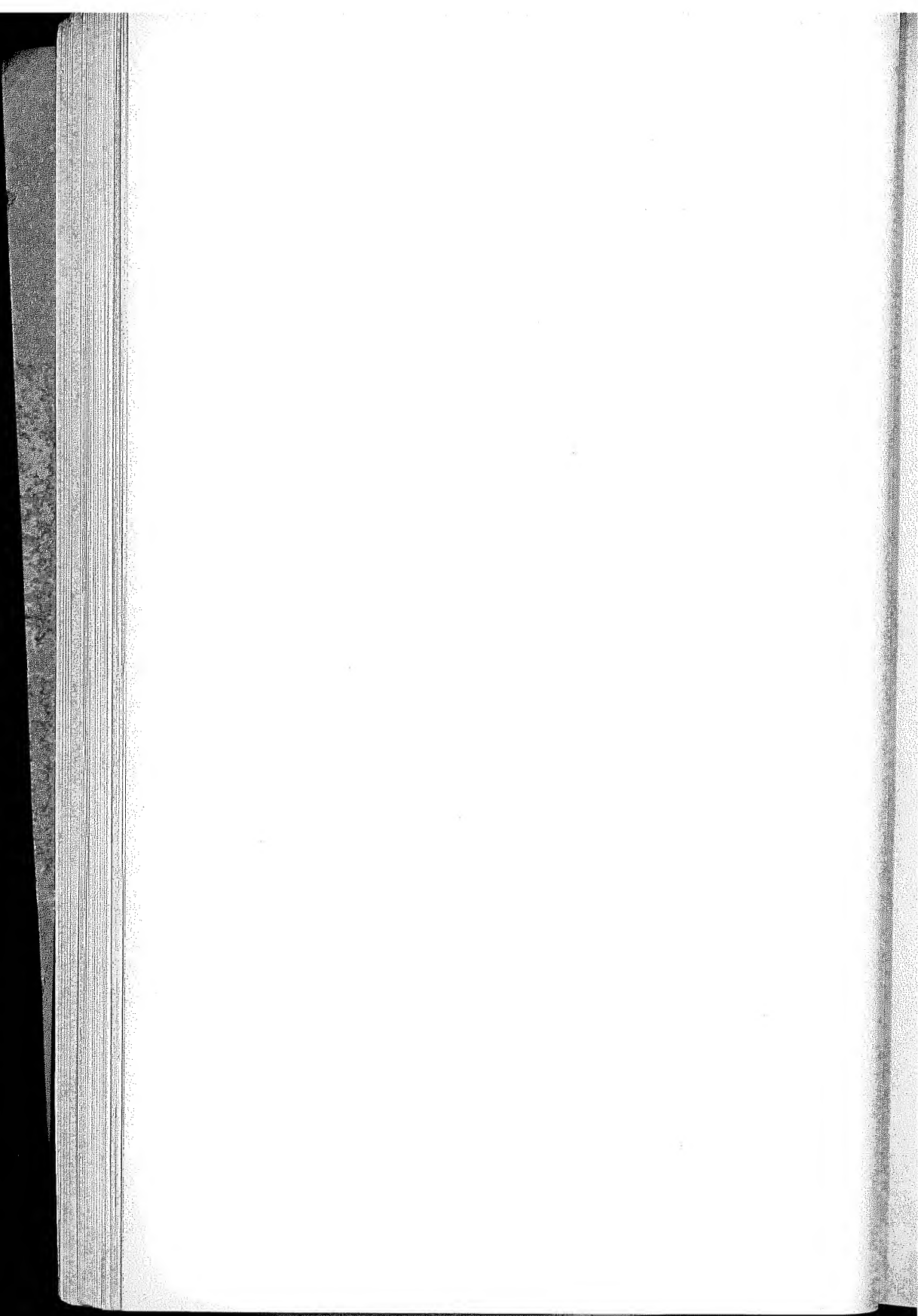
This section of the report and appendix 3 contain the information on advisory committees required by section 10(a) of Executive Order 11007, February 17, 1962.

The sole purpose of advisory committees is to advise the Director of Civil Defense. The Advisory Committee on the Design and Construction of Public Fallout Shelters is the only advisory committee that served the Office of Civil Defense during fiscal year 1968.

The chairman is a full-time, salaried OCD official, and the committee membership comprises, in addition to the chairman, 14 outstanding representatives of the American Institute of Architects, the American Institute of Planners, the Consulting Engineers Council, the National Society of Professional Engineers, the Engineers Joint Council, the American Society of Civil Engineers, and the Associated General Contractors of America, Inc. Each member is a person whose experience and talents enable him to make a major contribution to the achievement of OCD objectives.

The committee reviewed OCD programs of interest to architects, engineers, and urban designers and gave comments and suggestions. It considered detailed progress of the seven-State Direct Mail Shelter Development pilot program and its evaluation by the American Institute of Architects. The committee recommended against monetary compensation to architects for time expended in shelter feasibility studies on private projects. In addition, the committee reviewed the progress of the Community Shelter Planning program, the Professional Development Program, and the Faculty and Student Development Programs.

On June 27, 1968, the committee was officially continued until June 30, 1970, and two new members were appointed to represent the Associated General Contractors of America, Inc., replacing two members who resigned following 6 years of effective service.



WARNING AND EMERGENCY OPERATIONS

Well-defined operational systems that make the effective use of fallout shelters possible are: (1) *Civil defense alerting and warning* to alert people to impending attack and to direct them to shelters; (2) *command, control, and communications*, to keep people informed and to direct emergency operations; (3) *radiological monitoring and reporting* to collect, evaluate, and disseminate information on radioactive fallout; and (4) *emergency operations support* to develop, implement, and support community shelter plans and over-all government emergency operations plans at Federal, State, and local government levels. The status of these systems at the end of fiscal year 1968 is described in this part of the report.

CIVIL DEFENSE ALERTING AND WARNING

Alerting.—The alerting of Federal agencies and State governments to developments that require action to strengthen the Nation's readiness posture is a responsibility of the Office of Civil Defense. Procedures have been established for disseminating appropriate alert notices within the Federal establishment and to the States. These procedures are tested weekly at the national level, and at least quarterly at the regional level, either separately or as a part of military or civil defense exercises.

The Defense Coordination Teletypewriter Network (DEFCORD), established by the Office of Emergency Planning, is used by OCD to alert Federal agencies in the Washington, D.C., metropolitan area. The OCD regional offices alert Federal field agencies using a teletypewriter system and a telephone backup system.

Warning.—Federal warning systems are designed for passing warning to strategic points. State and local governments are responsible for dissemination to the public beyond these points. A civil defense warning system is operated throughout the continental United States, including Alaska. Using the most advanced techniques available, this system interconnects Federal, State, and local warning systems to a single warning network. Separate warning systems interfaced with the Continental Warning System serve Hawaii, American Samoa, Guam, Puerto Rico, and the Virgin Islands.

Federal Warning Systems

National Warning System (NAWAS).—The Federal portion of the civil defense warning system serving the continental United States is the National Warning System. Almost instantaneous attack warning information can be disseminated to State and local warning points from three national warning centers continuously manned and operated for OCD by the U.S. Army Strategic Communications Command (USASTRATCOM) warning officers. (See fig. 7.) The primary National Warning Center is in Cheyenne Mountain, Colorado Springs, Colo.; the remaining warning centers are located at Denton, Tex., and in the Washington, D.C., area. During fiscal year 1968, the system was expanded by the addition of 93 warning points at Federal installations and selected locations throughout the United States, bringing the total number of State and local warning points to 986 by June 30, 1968. (See fig. 8.)

A memorandum of understanding between the OCD and the United States Coast Guard (USCG) was revised during the year. (See app. 4.) The number of NAWAS locations using USCG facilities including their radio stations was reduced from 12 to eight. The USCG is responsible for monitoring NAWAS 24 hours a day, disseminating warnings of enemy attack, and broadcasting radiological fallout data to merchant vessels in or close to the territorial waters of the United States, providing: (1) None of the information disseminated is inimical to the national security, and (2) such priority broadcasts do not conflict with high priority Coast Guard communications.

NAWAS reconfiguration in South Dakota.—A new concept of NAWAS utilization within a State was developed during fiscal year 1968 for testing in South Dakota. This development will use a central exchange system by which multiple transmissions can occur simultaneously within the State. This concept of operation will be installed and evaluated during fiscal year 1969.

Washington Area Warning System.—This system, serving the Washington, D.C., metropolitan area, comprises 299 sirens and facilities for voice communication with local civil defense headquarters in the area and with certain Federal, civilian, and military installations.

Warning for Hawaii and U.S. Possessions.—A revised telephone warning system was designed for the State of Hawaii during fiscal year 1968 and will become operational early in fiscal year 1969. This new system will replace military circuits which are being phased out. From Hawaii, warning can be disseminated to Guam and American Samoa. Another Federal system serves points in Puerto Rico and the Virgin Islands.



Figure 7.—National Warning System (NAWAS).

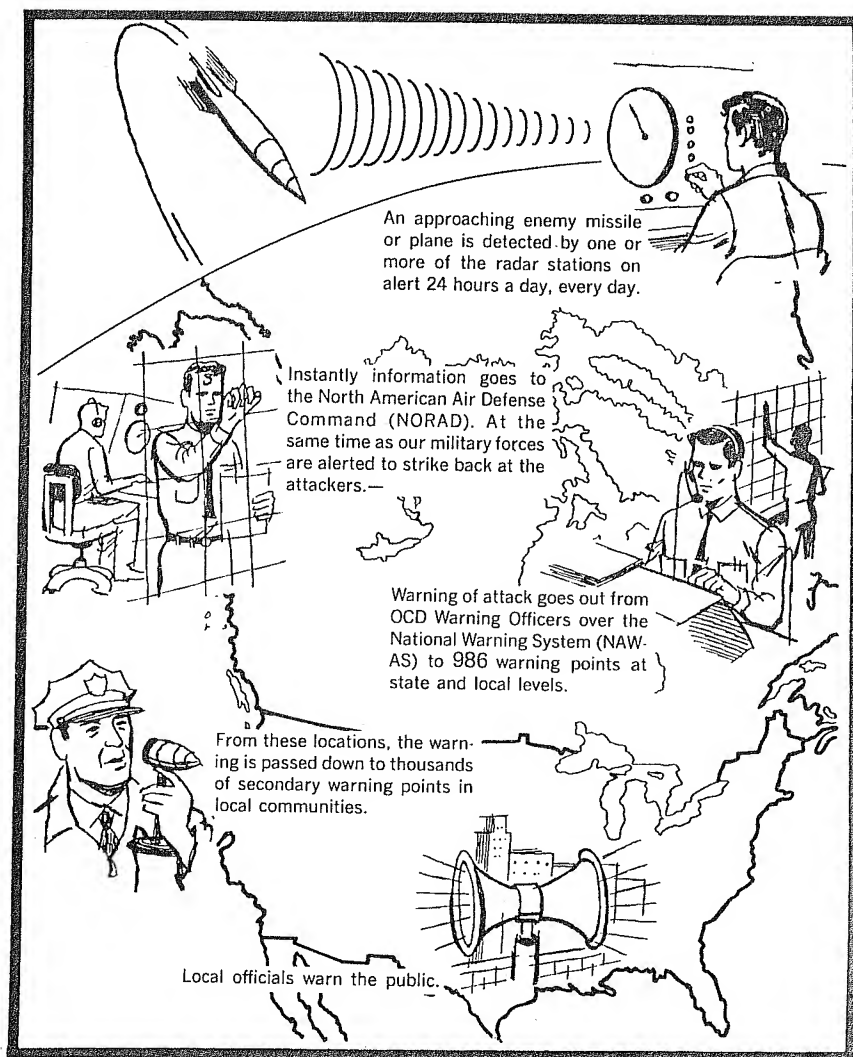


Figure 8.—Warning network in operation.

Radio Warning Decision Information Distribution System (DIDS).—The design of an experimental automatic radio warning system has been completed. This would be a low-frequency radio station network to provide warning information directly from the three National Warning Centers to all levels of government in the continental United States. Through the use of nine distribution transmitter control facilities, written and voice warnings could be received and outdoor sirens could be sounded automatically at locations with special terminal equipment. Sites for the distribution facilities have been located, and tests are underway to confirm system coverage.

The program for DIDS would provide transmitter and control devices and receiving terminals for voice. Some of these terminals would also be equipped for receiving written messages. Control terminals for local siren systems and individual sirens would be included. Typical locations for the receiving terminals would include Federal and State government agencies; State, city, and county emergency operating centers; NAWAS warning points; and, following arrangements with the Federal Communications Commission, emergency broadcasting radio stations which, in turn, would rebroadcast the warning to the general public.

In providing a direct warning from Federal to local levels, the DIDS response time nationwide would be 30 seconds. Design requirements include such effectiveness criteria that 99 percent of all receiving terminals would receive an intelligible voice message at least 90 percent of the time.

State and Local Warning Systems

State and local governments provide a variety of communications and warning facilities for the dissemination of warning and supplemental data from 986 NAWAS warning points to thousands of local warning points. Combination of existing land line and radio systems, as well as specially designed warning systems, are used for this purpose. Each State and local warning point is located with an existing governmental operation which is continuously manned, such as law enforcement or fire department headquarters. This assures 24-hour warning coverage for the areas served by each warning point. The OCD provides guidance and financial assistance to States and their political subdivisions for the purpose of strengthening their warning systems. NAWAS extensions have been installed with Federal matching funds assistance at 255 locations important to local civil defense organizations.

Protection of warning points.—In fiscal year 1964, the OCD began providing financial assistance to State and local governments, as necessary, for warning points with fallout protection and emergency power generators. A minimum protection factor of 100 is required because the warning point must be capable of continuous operation in the National Warning System under initial and subsequent attack conditions.

During fiscal year 1968, the Warning Point Fallout Protection Program was completed. By June 30, 1968, 185 warning points had completed construction and installation of equipment; 74 stations that had previously signed agreements to provide shelters were dropped from the program because of their inability to complete a facility within the funds allotted. In addition to the 185 stations, 22 warning points had met the OCD requirement without Federal funds. Fallout protection for the remaining warning points is being accomplished by the installation of alternate equipment in established emergency operating centers. There was no cost of operations during fiscal year 1968.

COMMAND, CONTROL, AND COMMUNICATIONS

OCD Federal Regional Centers

Each OCD regional office is an operating center at the Federal level, and will be the site of civil defense emergency operations in case of a nuclear attack. These buildings house the peacetime operational staff of the OCD and the Office of Emergency Planning. A few other government agencies maintain staff in the regional offices. OCD plans to provide permanent protected sites for all of the eight regional offices. The Region Five center at Denton, Tex., became operational in February 1964, and the Region One center at Maynard, Mass., in March 1968. (See fig. 9.) These buildings are underground structures built and equipped to afford protection to their occupants against some of the effects of a nuclear weapon. The buildings will contain food, water, and other supplies for up to 30 days.

Funds available to OCD for construction of the Federal centers total approximately \$9.9 million: about \$2.1 million from fiscal year 1962, and \$7.8 million from fiscal year 1966 appropriations. The construction contracts for Regions One and Eight were awarded in fiscal year 1967. Region One is completed, and Region Eight was 85 percent complete at fiscal yearend. Construction contracts were awarded for Region Six in July 1967, and Region Two in June 1968. Region Six construction was 90 percent complete by June 30, 1968.

During fiscal year 1968, final plans and specifications for the Region Three Center were completed, and preliminary plans for Regions Four and Seven were 30 percent complete by June 30, 1968.

The Region Three Center is to be located close to the existing headquarters at Thomasville, Ga. Region Four will develop an operational center by converting the basement area of the existing Federal Center in Battle Creek, Mich. The Region Seven Center will be located at the Sonoma County Airport where necessary water resources are available.

State and Local Emergency Operating Centers

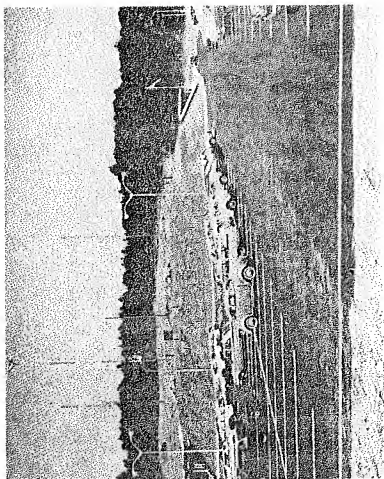
An emergency operating center (EOC) is a location within an existing building or a specially constructed facility where the decision-makers of State or local government assemble in peacetime or wartime emergencies to direct survival and recovery actions. EOC's which meet Federal standards and qualify for Federal matching funds, provide protection against the fallout effects of nuclear weapons, and have auxiliary electric generators and communications with other elements of emergency government. During recent civil disturbances, some Governors and Mayors activated their EOC's as the focal point for gathering information and for direction and control. In addition to emergency use, EOC's in many communities serve as the day-to-day headquarters for the civil defense staff and other elements of government such as fire and police departments.

During fiscal year 1968, Federal matching funds totaling approximately \$5.6 million were obligated to assist State and local governments in the establishment of protected Emergency Operating Centers. These funds were used for the planning, design, construction, and equipment of such centers. Federal assistance criteria authorize a maximum of 85 and a minimum of 50 square feet per staff member and a protection factor (Pf) of 100 or more.

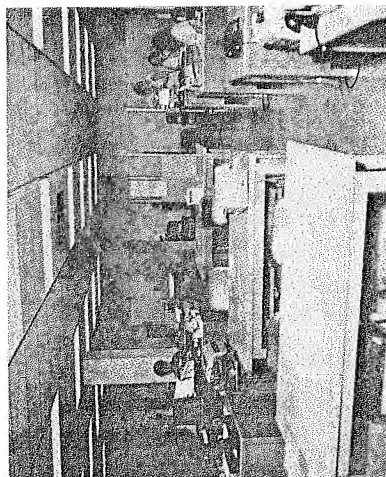
By June 30, 1968, a total of 3,001 EOC's had been established or were in the process of being established. The number of Federally funded State and local EOC's was increased by 75. This brought the total of Federally funded centers to 1,044 of which 633 have been completed. In addition, 68 centers were established or were being established this fiscal year without the use of Federal funds, increasing the total of non-Federally funded centers to 1,957, of which 1,756 have been completed. (See tables 8 and 9.)

Operational Communications

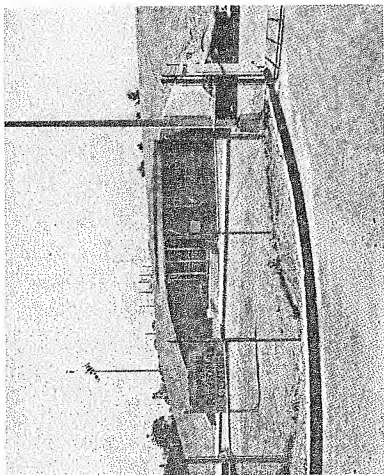
Essential Federal to State communications for conducting civil defense operations on a nationwide basis are provided through the use of two communications systems described below. Both systems are maintained and operated by the U.S. Army Strategic Communications



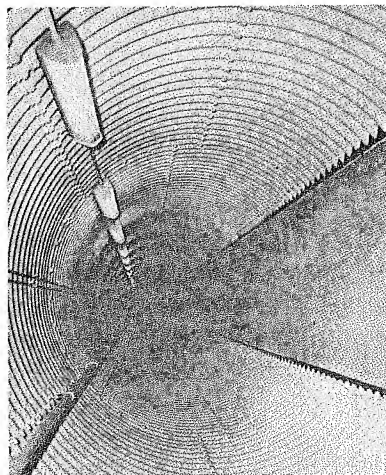
b. General view of EOC and area.



d. General office area.



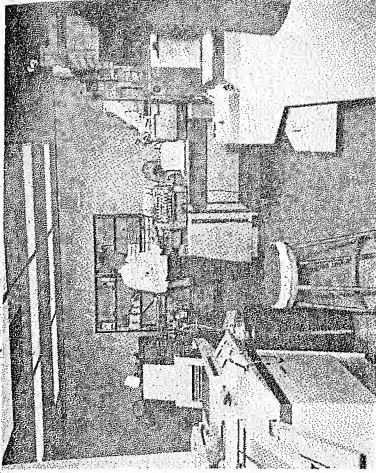
a. Front entrance.



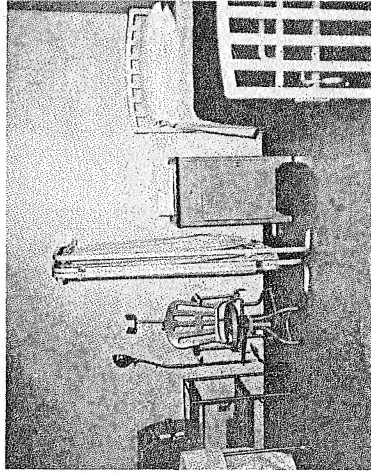
c. Service tunnel.

Figure 9.—OCD Federal Regional Center, Maynard, Mass.

d. General office area.



f. Reproduction room.

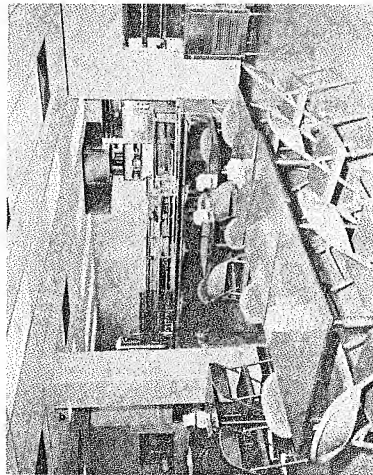


h. Medical room.

c. Service tunnel.



e. Operations room.



g. Cafeteria area.

Figure 9.—(Continued.)

Command (USASTRATCOM) in accordance with the policy guidance and requirements furnished by OCD.

NACOM-1 (Primary System).—The Civil Defense Telephone and Teletype System (NACOM 1) is the primary system for transmitting OCD operational communications. (See fig. 10.) This system is designed for speed, flexibility, and continuity of service required for civil defense emergencies between the OCD national headquarters and the eight regional headquarters, and between OCD regional headquarters and the State civil defense offices. Automatic Voice Network (AUTOVON) circuits are used for NACOM-1 communications between OCD national and regional headquarters. All OCD regions now have AUTOVON circuit pre-emption capability. All OCD regional communications centers have access to the Automatic Digital Network (AUTODIN), a Defense Communications System of teletype circuits. Fiscal year 1968 improvements included the installation of AUTODIN terminals for secure on-line communications at OCD Regions One, Four, and Five. The remaining five regions are programed as they are relocated into their new regional centers. Dedicated full-period private voice and teletype circuits are used between OCD regional and State civil defense offices.

TABLE 8.—*Status of the Emergency Operating Center (EOC) Program as of 30 June 1968*

Category	State	Local	Total
Funded and non-funded.....	244	2, 757	3, 001
Completed.....	153	2, 236	2, 389
In process.....	91	521	612
Funded (Federal matching).....	196	848	1, 044
Completed.....	115	518	633
In process.....	81	330	411
Non-funded (100% State and local).....	48	1, 909	1, 957
Completed.....	38	1, 718	1, 756
In process.....	10	191	201

TABLE 9.—Number of State and Local EOC's as of 30 June 1968

Type of center	Grand total	Completed			In process		
		Total	Type of funding		Total	Type of funding	
			Federal match- ing	Non- federally funded		Federal match- ing	Non- federally funded
Total.....	3, 001	2, 389	633	1, 756	612	411	201
State.....	83	54	46	8	29	29	0
State area.....	131	99	69	30	62	52	10
County.....	619	423	170	253	193	121	75
Combined ¹	633	454	153	301	179	116	63
City or municipality.....	1, 505	1, 359	195	1, 164	146	93	53

City-county, etc.

NACOM-2 (Backup System).—The Civil Defense Radio System, NACOM-2, is the backup system for NACOM-1. (See fig. 11.) NACOM-2 is a high-frequency radio network for transmission of voice, code, or radio-teletype messages. Control facilities for both NACOM-1 and NACOM-2 are located together to make them readily available.

Fiscal year 1968 improvements included installations in three more States, making NACOM-2 operational in 42 States, the District of Columbia, Puerto Rico, and the Canal Zone. Lease agreements have been signed with six additional States and American Samoa.

Emergency Broadcast System

The Emergency Broadcast System (EBS) is designed for use by the President and National, State, and local officials to reach the public promptly with emergency information preceding, during, and following an enemy attack. The EBS plan is based on the requirements of the White House, the Office of Emergency Planning, and the OCD. The EBS is managed by the Federal Communications Commission in cooperation with the broadcasting industry under the authority of Executive Order 11092, February 26, 1963. Actions will continue to tie EOC's to the EBS.

At the end of the year, a total of 2,762 broadcasting stations had National Defense Emergency Authorizations (NDEA) to participate in the EBS.

Broadcast Station Protection Program.—Throughout the year, OCD continued the Broadcast Station Protection Program. This program provides fallout protection, emergency power when needed, and

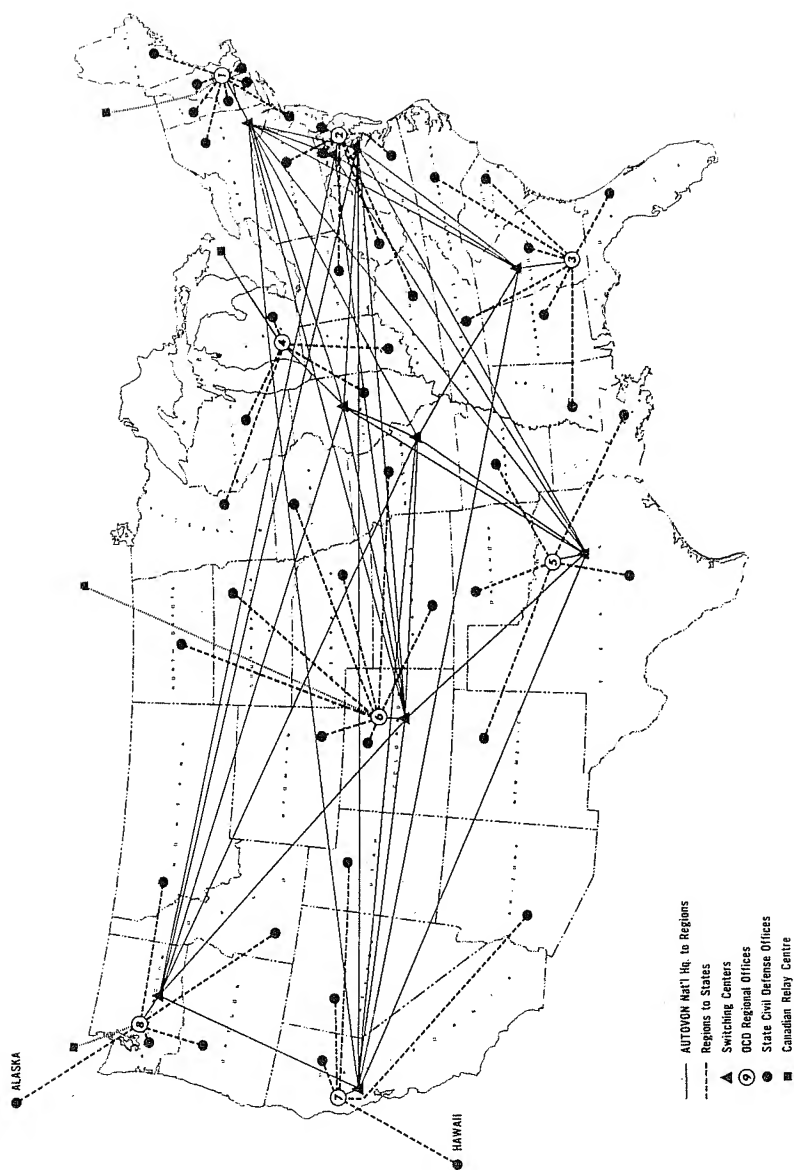


Figure 10.—Civil Defense Telephone and Teletype System (NACOM 1).

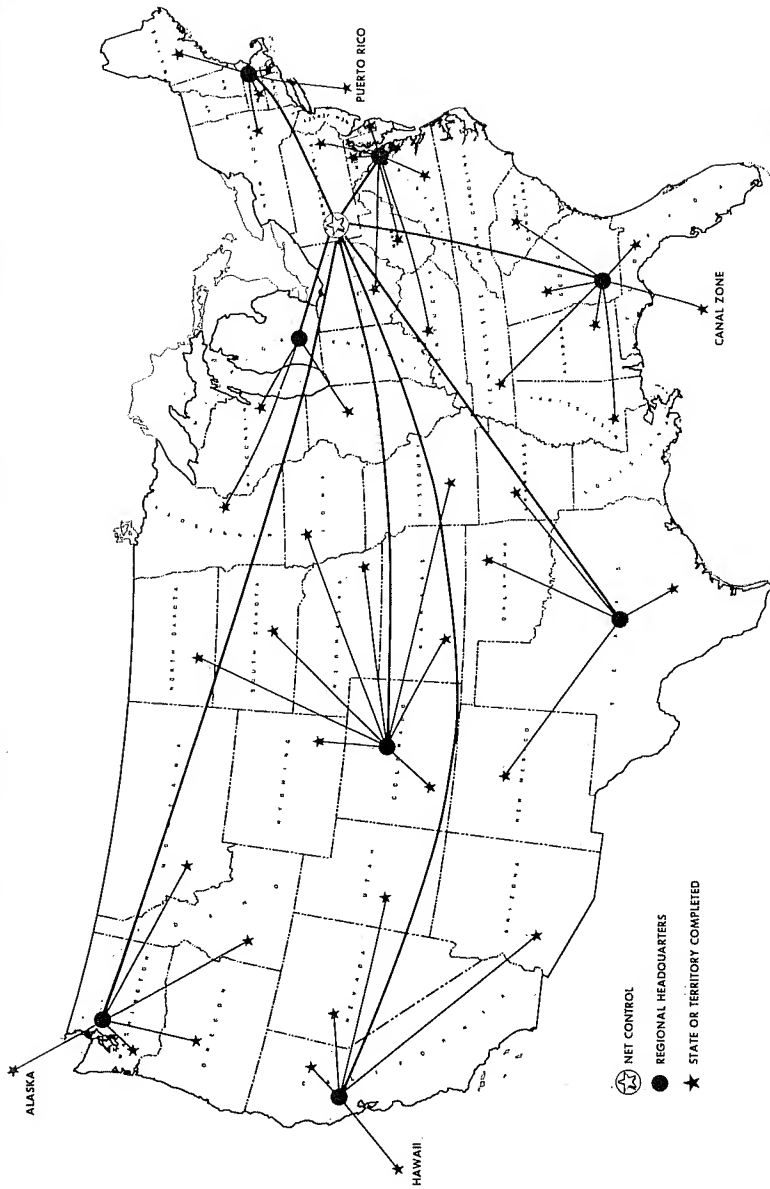


Figure 11.—Civil Defense Radio System (NACOM 2).

programming equipment to selected key EBS stations enabling them to remain on the air under fallout conditions and provide nationwide coverage for Presidential programming. A total of 629 stations were selected for participation in this program. As of June 30, 1968, 535 had completed fallout protection, and 471 of the 535 had also provided required equipment. Since the 629 stations provide excellent national population coverage—98 percent—for Presidential programming and also provide some State and local programming capability, no additional stations are planned for protection with Federal funds.

Support of State and Local Communications Systems

Fiscal year 1968 was the first year that State and local communications planning was conducted under the new guidance, Emergency Communications, Part E, Chapter 3, of the Federal Civil Defense Guide. This guidance set forth the following principle: "The national program to develop a civil defense lifesaving and damage-limiting capability is based on the fundamental precepts of (1) planning and preparing for the most effective use of all existing resources, and (2) acquiring additional means only where it is clearly necessary in order to improve the effectiveness of existing resources for emergency use."

The new Emergency Communication guidance provided State and local governments with the most practical and economical approach for planning, developing, and maintaining an emergency communications capability by making maximum use of existing resources. By June 30, 1968, 29 States and 291 local governments had completed communications planning reports. Financial assistance in the amount of \$173,423 was provided to 5 States and 26 local governments for the conduct of this essential planning activity.

Federal Assistance funds, based on the criteria of the new guidance, for communications amounted to a Federal share of \$1,273,000. The emphasis on emergency use of existing systems as well as the deferment of hardware acquisition pending the completion of planning reports resulted in a substantial reduction in the amount of Federal matching funds granted for communications equipment during fiscal year 1968.

The Radio Amateur Civil Emergency Services (RACES) remained operational in all States and included more than 1,500 approved State, county, and local plans at the end of fiscal year 1968. RACES enables amateur radio operators to perform emergency communications functions as an important emergency supplement to State and local communications systems.

Damage Assessment

The Damage Assessment System is designed to develop the best possible estimates of the potential range of damage to resources and population during and after a nuclear attack. These estimates are based upon enemy capabilities and a variety of civil defense postures. The information emanating from the system provides a basis for the conduct of effective emergency operations to achieve national recovery.

Executive Order 10952 of July 20, 1961, assigned to the Office of Civil Defense the responsibility for developing plans and systems for nationwide postattack assessment of damage. Under other Executive Orders and in consonance with OCD, Federal agencies are responsible for maintaining damage assessment capabilities related to their functions. The agencies provide pertinent data on their resource categories to the Office of Civil Defense.

Major accomplishments and developments in damage assessment during fiscal year 1968 include the following:

1. The OCD Manual Damage Estimation System was deployed. This system enables each region and State to make broad-scale estimates of casualties and housing damage following a nuclear attack. Such estimates are vital to effective life-saving actions and recovery operations. The manual system enables the regions and States to make rapid, interim assessments of the attack situation in their areas of responsibility pending more precise information from direct inspection and field surveys. The deployment of the system involved the production and distribution of an integrated series of maps, overlays, templates, and resource data supplemented by a manual, instructions, and worksheets. In February, a workshop for representatives from the regions was held at the Staff College, Battle Creek, Mich., to introduce and explain the operation of the system. Each region has designated a Damage Assessment Officer (DAO) who is responsible for the manual program and its deployment in the States assigned to the region. The DAO is also responsible for training his own regional staff, personnel of the headquarters staff in the States of his region, and the regional level personnel of other Federal agencies in his area.

2. A project was initiated with the Bureau of the Census for the development of a new National Location Code based upon the 1970 censuses of population and housing.

3. Under a contract with the Department of Health, Education, and Welfare, a project was undertaken by the Dallas City Water Department to develop a prototype emergency water supply plan for determining methods of providing water to surviving population and

industry after nuclear attack. This plan will be based on an analysis of the effects of simulated nuclear attack on Dallas and the resulting damage sustained by the water system in Dallas and surrounding areas.

4. A feasibility study of electric power systems was initiated to determine the capability of the systems to provide adequate power to postattack survivors. The United States Bureau of Reclamation will study its electric power network facilities to determine the performance of the transmission systems after a nuclear attack. The Bureau will ultimately develop a power flow computer model that can be used to identify the cities and towns that may be denied electric power under various postattack environments during the shelter period.

5. The input/output study being developed by the Office of Business Economics, Department of Commerce, was expanded to include data on special industries. The results of this study will provide an improved data base for estimating the effectiveness of various civil defense systems designed to reduce the effects of enemy attacks on population and property.

6. A pilot study was initiated to analyze the critical elements of oil-field systems. The study, conducted by the Department of Interior, Bureau of Mines, Office of Oil and Gas, involves the large oilfield at Hastings West, Brazoria County, Tex. The results of this study will be used to determine the feasibility of analyzing specific, large oilfield systems that are capable of producing sufficient crude oil to meet demands in the United States after a nuclear attack.

7. A pilot study, conducted by the Public Health Service, Department of Health, Education, and Welfare, was made of the critical elements of sewerage systems using a sample of systems serving areas with more than 50,000 population. This study will be the basis for determining the feasibility of inventorying the critical elements of major sewerage facilities to provide data for evaluating postattack damage to such facilities.

8. The Bureau of the Census prepared a listing of the radiological monitoring stations identified by latitude and longitude for each station. This will be a valuable addition to the data base.

9. The Department of Transportation made an assessment of available transportation data that would be necessary for postattack analysis of civilian transportation capability. The results of this study will provide the basis for determining the residual of the transportation resource after attack.

10. Through the Census Bureau, the Office of Oil and Gas, Department of Interior, continued to collect information on petroleum storage at local levels. This will be used in updating the data base resource categories on petroleum storage.

11. The Bureau of the Census continued the project of developing current year estimates and future year projections of the population of each county in the United States, invaluable information for many civil defense programs.

RADIOLOGICAL MONITORING AND REPORTING

In the event of a nuclear attack on the United States, fallout radiation in varying degrees will be present in many areas of the country. The extent and intensity of the fallout contamination will depend upon the total weight and distribution of the attack, the design of the weapon, the wind and weather, the type of soil, and the topography. Ionizing radiation emitted by fallout could cause tens of millions of casualties, prevent performance of postattack operations, restrict the survivors' ability to work, and prevent the use of some areas and facilities for weeks or months. Hence, an effective system for detecting and monitoring radiological fallout is essential for the optimum saving of lives.

A nationwide radiological monitoring system has been designed for the collection, evaluation, and dissemination of radiological information to all levels of government. Major elements of this system include: (1) Monitoring capability in public fallout shelters, at strategically located monitoring and reporting stations, in emergency services, and by aerial and surface mobile teams; (2) data processing and evaluating capabilities at emergency operating centers; and (3) capability within each State to maintain and calibrate radiation instruments used in the monitoring system.

Monitoring Operations

Monitoring stations.—A total of 65,833 Federal, State and local radiological monitoring stations were operational by the end of fiscal year 1968. This included 12,529 Federal and 53,304 State and local stations. The total net gain for the year was 2,690 stations. (See fig. 12.) Each monitoring station meeting minimum requirements has been provided with one radiological defense operational set CD V-777. The requirements include suitable geographic location, fallout protection, adequate communications facilities, and at least two trained radiological monitors. Some stations are located in public fallout shelters that meet the requirements. The monitoring staff in these cases would perform both shelter and operational monitoring functions. Upon completion of their primary assignments, shelter monitors would be reassigned to mobile monitoring, as required.

Some monitoring stations are located at sites of Federal agencies having civil defense responsibilities assigned by Executive Orders. Some are located at State facilities, but the majority, established by local governments, are at local facilities. During an emergency, Federal stations would supply local governments with fallout data, as provided by established agreements. In addition, certain Federal stations would transmit fallout data to the OCD.

Selected monitoring stations having extensive mobile monitoring assignments are furnished additional radiological defense equipment in the form of the radiological monitoring support set CD V-777A. It includes a remote reading, high-range survey meter that permits radiation measurements up to a distance of 25 feet. With this meter, monitors within stations can obtain radiation measurements with a minimum of exposure to high radiation intensities outside. The support set also makes more survey meters available to stations with extensive mobile monitoring tasks or aerial monitoring support operations. The remote reading survey meter is made available separately for selected monitoring locations with major responsibilities for reporting radiological data.

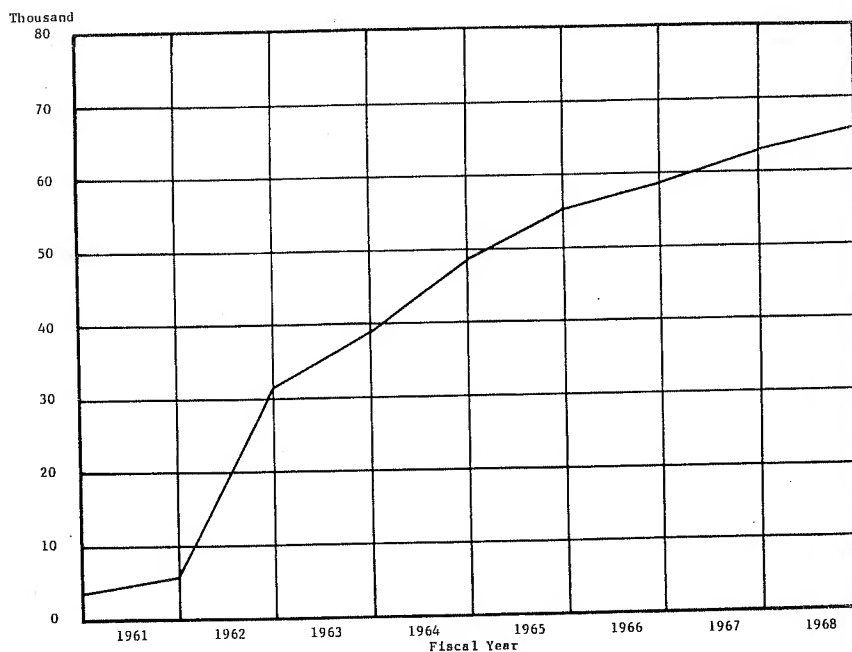


Figure 12.—Growth in number of Federal, State, and local radiological monitoring stations.

Shelter monitoring.—A total of 94,266 public fallout shelters had been provided with at least one radiation kit CD V-777-1 by the end of the year. This was a net increase of 10,135 during the year. At least two trained radiological monitors are scheduled for each shelter kit positioned in these shelters.

Radiation measurements in each shelter would serve as a basis for determining (1) the best protected shelter areas in a facility, (2) whether adjoining areas of the facility should be used to alleviate crowding when radiation intensities permit, and (3) the amount of radiation exposure to be recorded for shelter occupants. The information would also be used to determine emergency excursions outside the shelter, and as a basis for requesting advice from the EOC on emergency action in extreme situations. Finally, these data would be the basis for situation information for shelter occupants and would furnish RADEF information for the shelter manager's report of the general shelter status to the EOC.

Aerial monitoring.—At the end of the fiscal year, 47 States had been furnished equipment to develop aerial monitoring capability. A total of 218 CD V-781 aerial survey meters and supporting equipment had been issued. Capability for aerial radiological monitoring operations is being developed in consonance with the State resources plans and the North American Air Defense Command (NORAD) Plan, "Security Control of Air Traffic and Navigation Aids (SCATANA)." The State Aeronautical Authority serves as the principal coordinating agency for the utilization of non-air-carrier aircraft. Under the provisions of the Federal Aviation Administration (FAA), State and Regional Defense Airlift (SARDA) Plan, the States are developing guidance for the emergency use of non-air-carrier aircraft as a part of the Transportation Services portion of the State Plan for Emergency Management of Resources. Thirty-nine States had completed this plan at the close of fiscal year 1968.

Aerial monitoring supplements the work of monitoring stations and their mobile teams and would be necessary for obtaining early data for planning immediate emergency operations. It would be the only practical means of rapidly monitoring farming and grazing lands, as well as other large rural areas. Aerial monitoring would also be needed to overcome monitoring limitations caused by damage to on-station monitoring locations and by restrictions on mobile surface monitoring in areas having high radiation intensity.

Postattack radiation exposure control.—The States have been supplied with 1,640,040 dosimeters and 70,003 dosimeter chargers for use by emergency services personnel conducting postattack operations. The dosimeters are for measurement of the workers' accumulated radiation exposure dose as a basis for exposure control. No issues were made for this program during fiscal year 1968.

Fallout forecasts.—The U.S. Weather Bureau continued, under contract to OCD, to disseminate data on upper wind observations throughout the continental United States. This information, transmitted twice daily over weather reporting circuits to several hundred locations, is redistributed as needed and can be used at emergency operating centers to develop fallout forecasts.

Distribution and Servicing of Instruments

Distribution.—Radiological defense instruments distributed during fiscal year 1968 totaled 161,954, making a cumulative total of almost 3.5 million as follows: (Also, see fig. 13.)

Public fallout shelters.....	514, 124
State and local operational purposes.....	2, 043, 553
Federal operational purposes.....	235, 440
Maintenance float stock and replacement.....	177, 663
Training and other purposes.....	528, 042
Total	3, 498, 822

Contracts were awarded during fiscal year 1968 in the amount of \$.6 million to procure replenishment repair parts for radiological monitoring instruments, and selected items of electronic test equipment for the State maintenance and calibration shops. The major portion of the procurement was for high value signal resistors in glass capsules for use in the instruments.

Millions of
Instruments

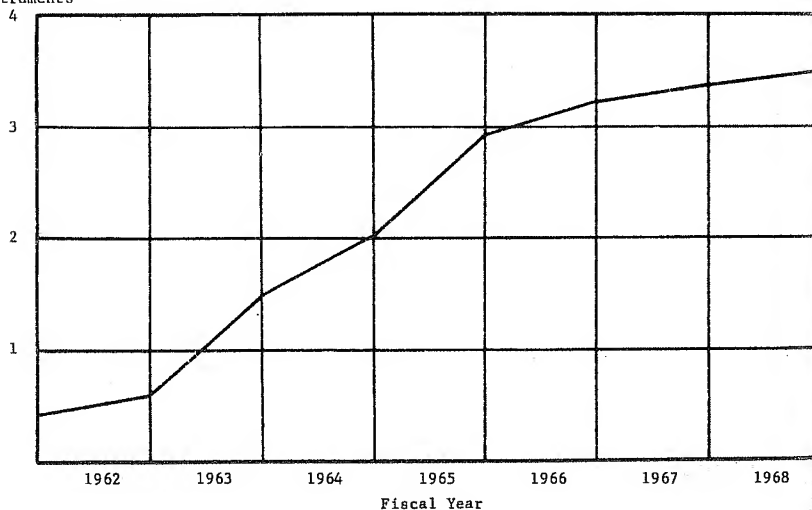


Figure 13.—Cumulative distribution of radiological defense instruments.

Inspection, maintenance, and calibration.—Radiation detection and measuring instruments are the only known means for determining the exact hazard to people and animals from radioactive fallout. They are required for measuring exposure rates and doses in shelters and also for warning people against overexposure when performing emergency services outside of shelters. To provide a reliable operational capability, these sensitive instruments must be periodically inspected, calibrated, and repaired. At the end of fiscal year 1968, the Federally funded inspection, maintenance, and calibration program was in operation in the 50 States, the District of Columbia, and Puerto Rico. The instruments of Federal, State, and local governments are calibrated and maintained at central facilities that are a part of the States' systems, and major repairs are made there. The service also includes the pickup and return of the instruments. During the fourth quarter of the fiscal year, 27 State shops had been issued the newly developed multicurie calibrator for use in calibration of high-range radiological instruments. (See fig. 14.)

Training and Technical Guidance

During fiscal year 1968, additional radiological monitors were trained at U.S. Army bases and through the Civil Defense Adult Education and the Civil Defense University Extension Programs. Monitor instructors and radiological defense officers were trained by means of State college and university extension courses. At least two monitors were trained for each of the 65,833 monitoring stations in operation by the end of the fiscal year. To provide for a 24-hour sustained emergency operational capability, many stations have additional trained monitors. Technical guidance for planning, implementing, and operating the radiological defense system is furnished to State and local governments in the Federal Civil Defense Guide.

EMERGENCY OPERATIONS SUPPORT

There is an important need to have effective emergency operational support systems both for community shelter planning and for overall government emergency operations planning. Government authorities and the general public must be warned of impending disaster to implement their plans. They must be provided information and instructions concerning the hazards and actions to take, and they must have the necessary equipment in operating condition to make necessary decisions. In addition, they must have the required services support to assure the effective implementation of their plans by using the most reliable information, systems, equipment, and facilities available.

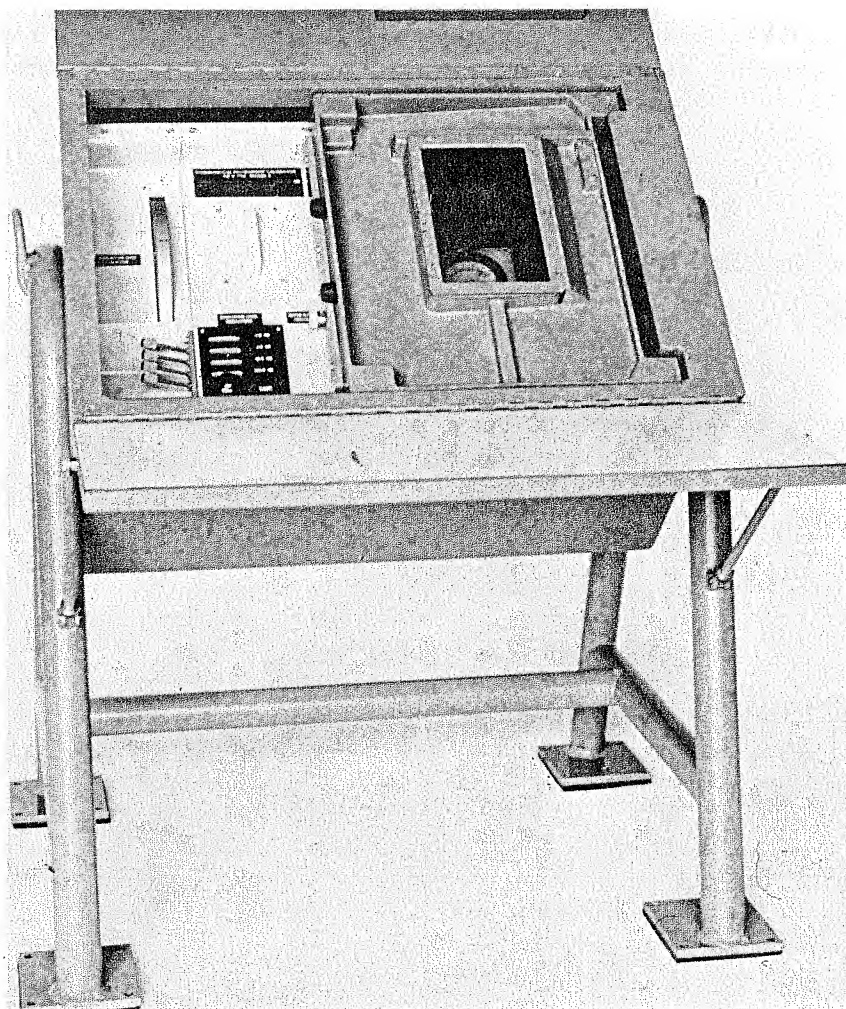


Figure 14.—Multicurie calibrator for use in calibration of high-range radiological instruments.

Emergency Operations Systems Development (EOSD)

The Emergency Operations Systems Development program bridges the gap between research and operations. The work is generally carried out in two phases. Phase I work includes distillation of relevant existing research; quantitative evaluation of problems resulting from light, medium, and heavy attacks; analyses of existing State and local capability to cope with these problems; and recommendations based

on cost-effectiveness analysis of Federal-State-local programs determined necessary. Phase II work includes field testing, as necessary; production of recommended guidance materials; development of detailed training requirements; and development of recommended management techniques for local operational systems.

People, facilities, equipment, and supplies are the basic components of State and local systems. The EOSD program seeks to provide the systems which will combine these components in the most economical and effective ways.

During fiscal year 1968, emphasis was continued on developing systems for the orderly increase of civil defense readiness in periods of heightened international tension, and on providing guidance to State and local governments on actions to take during such a period. Specific projects during the year included the following:

Emergency Operations Planning.—Guidance on preparing local government civil defense emergency plans was prepared during fiscal year 1968, and was reviewed by local, State, and Federal personnel. This Federal Civil Defense Guide package on emergency planning was being printed at the end of fiscal year 1968, and is scheduled for distribution early in fiscal year 1969.

Fire.—Based on the results of EOSD studies, several components of an austere nuclear fire defense system were being reviewed and field tested.

The OCD also completed preparation of Federal Civil Defense Guide materials on planning and programs for fire prevention and control during civil defense emergencies. Following review by a task force including representatives of OCD, State, and local civil defense offices, and fire professional associations, these materials were planned for publication during the first half of fiscal year 1969.

The International Association of Fire Chiefs (IAFC) was testing for OCD:

1. The "Self-Help Emergency Firefighting Training Kit," in 100 communities. When testing is completed, the materials will be packaged in kits to be distributed nationwide for use by local fire departments.

2. Local Assessment of the Conflagration Potential of Urban Areas. This is a system for evaluating and rating the firespread potential of blocks of buildings in urban areas, as a basis for fire defense planning.

The IAFC also completed "Shelter Fire Guard" and "Support Assistants for Fire Emergency" materials in draft form. These were to be tested and published in fiscal year 1969.

The IAFC continued work on development of Fire Defense Leadership Seminar materials, and the U.S. Forest Service continued

development of example fire defense plans for use by State and local governments.

Law enforcement.—Based on results of an EOSD project on the maintenance of law enforcement, and with the assistance of the International Association of Chiefs of Police and the National Sheriffs' Association, OCD prepared and reviewed guidance materials to help chiefs of police and sheriffs develop plans and programs for law enforcement operations in civil defense emergencies. These guidance materials were to be published and distributed during fiscal year 1969.

Public Works Engineering.—Work was begun at the end of the fiscal year to develop a Federal Civil Defense Guide chapter and supporting appendixes on Public Works Engineering operations during civil defense emergencies. The materials are based on the findings and conclusions of an EOSD study, and on field testing to be carried out in fiscal year 1969 in communities which have completed community shelter plans and have developed requirements for engineering support of decontamination, fire defense, and rescue operations.

Rescue.—Drafts of Federal Civil Defense Guide materials on rescue were prepared. These were to be reviewed by OCD, and State and local CD representatives in fiscal year 1969. New rescue truck and equipment criteria were developed and published in the Federal Civil Defense Guide.

CSP shelter allocation.—The Phase II EOSD study on a "Community Shelter Planning Shelter Allocation Traffic Assignment Model," was completed. The study indicated that substantial improvements in shelter utilization are possible through systematic analysis of the interrelationship of shelter allocations and traffic assignments. A model that was formulated should be applicable in most areas with populations in excess of 200,000. As a result, OCD has joined with the U.S. Bureau of the Census to develop basic computer programs and technology. The results would allow Federal, State, and local governments to make optimum use of data from the 1970 Census to assist computer and manual CSP shelter allocation and updating. This joint project will include investigation of the feasibility of producing graphic outputs and using computer techniques in shelter planning.

Radef.—The second phase of the study of the radiological defense system was completed and tested during fiscal year 1968. Nearly 100 Federal, State, and local government personnel were participants, exercise monitors, or observers in the field tests. Results of the Phase II study indicated that OCD should redefine current organization and procedures for reporting, analysis, and display of radiological information, to provide decisionmakers with more timely information. Therefore, OCD is revising current guidance materials to reflect new

concepts and a new, simpler system of deployment. The revised guidance was scheduled for review by a task force of OCD, State, and local civil defense and radiological and communications professionals during fiscal year 1969.

Military support.—Complementary studies were completed by OCD and the Army Institute of Combined Arms and Support Research Office. These studies were exchanged for review and agreement on military support concepts, operating systems, training requirements, administration, and intergovernmental coordination.

Department of the Army Field Manual FM 20-10, "Military Support of Civil Defense," was updated during the fiscal year by Headquarters, Department of the Army, in cooperation with OCD.

Health-Medical.—Basic guidance materials for support of emergency health-medical operations in a civil defense emergency were developed in April 1968. The material is currently being prepared in draft form for OCD review as a proposed Federal Civil Defense Guide issuance.

Emergency manning.—A final EOSD report was received in fiscal year 1968 on identification and assessment of emergency period manpower and material support capability, availability, and organizational effectiveness of 100 selected national voluntary agencies, non-government organizations, and professional associations.

Automatic Data Processing Systems (ADP)

The National Civil Defense Computer Facility (NCDCF), located at Olney, Md., and operated under the Corps of Engineers, provided computer support for the Office of Civil Defense in a wide variety of programs. Included in these programs were damage assessment, vulnerability studies, fallout shelter, and a large number of management systems. Services also included systems analysis, system design, computer programing, data reduction, and consultant assistance. Table 10 provides a summary of computer time used during fiscal year 1968.

The NCDCF made a major contribution to the Civil Defense Exercise (CDEX-67) conducted in the first half of the fiscal year. It furnished the exercise messages for the control group for some 5,000 points and provided damage assessment printouts for resources during the exercise play. NCDCF is expected to assume a major role in future civil defense exercises.

Ad hoc committee study.—The Director of Civil Defense established an ad hoc committee to determine the Automatic Data Processing (ADP) and Communications Support Requirements for the Office of Civil Defense in the 1970-1975 time frame. With the planned construction of a new Federal Regional Center for Region Two in

TABLE 10.—*NCDCF Computer utilization CDC 3600/3200 system, fiscal year 1968*

Programs	Hours		
	3600 System	3200 System	Total
Damage Assessment.....	2, 660	2, 050	4, 710
Research.....	340	450	790
National Fallout Shelter System.....	2, 210	1, 550	3, 760
Management.....	560	1, 260	1, 820
Other Government Agencies.....	170	290	460
Miscellaneous ¹	760	730	1, 490
Totals.....	*6, 700	**6, 330	***13, 030

¹ Includes: Preventive maintenance, machine modifications, and downtime.

Converting Hours into Shifts:

* 2.3 Shifts

** 2.1 Shifts

*** 2.2 Shifts

fiscal year 1970 and space allocation in the Center for the National Civil Defense Computer Facility, it was essential to determine the capability of the present Control Data Corporation 3600/3200 configuration to handle the future ADP and communications requirements of the Office of Civil Defense. The preliminary findings of the committee indicated a saturation of the present computer system by 1970 and the probable need of a larger, third-generation computer for installation in the new Federal Regional Center. The translation of the ADP and Communications Support Requirements into hardware, software, and personnel requirements has been started, and the results of this effort will serve as a base to obtain the necessary funds and the technical specifications needed for the procurement process.

Program Management Information Systems

Major accomplishments under this program include the following:

1. The Generalized Automatic Data Processing System for civil defense was implemented in the District of Columbia. The system was designed and developed in the Office of Civil Defense to assist local civil defense directors in managing their civil defense programs. The prototype system installed in the District of Columbia has operated successfully as an effective management tool.

2. Plans were made to test and evaluate the Generalized Automatic Data Processing System for civil defense at other sites. Arrangements are underway with the City of Baltimore, Md., to install the system there for independent testing purposes. Preliminary negotiations

have been initiated also with the City of Philadelphia, Pa., for installation of the system in fiscal year 1969.

3. To improve the quality of local governments and their civil defense programs, the Office of Civil Defense provided some support to a research project in Municipal Management Information Systems. This research was based on the concept that sound governmental operations and good decisionmaking at the local level result from timely availability of information on all current operations. The School of Public Administration, University of Southern California, developed a systems concept and systems specifications for a Municipal Civil Defense Information Subsystem and a total Municipal Management Information System. The City of Burbank, Calif., served as the pilot city in the research effort and contributed significantly to the development of the system requirements. If financial support can be obtained from other Federal agencies and/or private foundations, the implementation phase of the project can be initiated.

4. In cooperation with the Defense Supply Agency, a Quality Control System was designed and its implementation started. The system provides a computer-oriented means of compiling information on the condition of stocks in shelters as reported by inspectors. With the shelf life of many stock items reaching its limit, this system will be useful in a replacement program.

5. A number of on-going management systems were revised and improved during the fiscal year. These include: (1) Integrated Management Information System (IMIS), (2) Emergency Operating Centers (EOC), and (3) Architects and Engineers Directory.

Integrated Management Information System (IMIS).—The Integrated Management Information System of the Office of Civil Defense is a computer-based information system which includes the procedures for data input, a data bank for storage of information required for the system, and the routines for preparing management reports.

The system permits the OCD to: (1) Determine periodically the accomplishment of jurisdictions submitting program papers; (2) compare the goals of State and local jurisdictions with those established for the national OCD programs on immediate, annual, and longer time bases; and (3) measure State and local program progress by relating progress to goals and elapsed time. It permits the OCD to evaluate staff manpower utilization of local civil defense agencies, and it indicates apparent weaknesses and strengths of the localities in capabilities to protect their people from fallout and associated hazards.

The most important data source in the IMIS is the program paper and progress report for local civil defense. This document is used

alternately as a program paper and as a progress report, at 6-month intervals. Each participating local government is provided a pre-printed program form listing the specific activities and elements of a balanced civil defense program—with appropriate provisions for reporting each item quantitatively. This form is then computer processed, so that only updating is needed before returning it to OCD.

IMIS became operational early in fiscal year 1966. During fiscal years 1967 and 1968, design modifications were made and tested, and many improvements were included in the revised forms.

It is expected that this computer-based management information system will prove to be a more and more valuable tool for management at the Federal, State, and local levels in monitoring and evaluating State and local programs. Special summaries and reports produced by IMIS will enable management to determine accomplishments, measure progress, compare goals, and evaluate manpower utilization.

As part of a continuing field testing program, all OCD regional officials were indoctrinated in the use of IMIS management reports during fiscal year 1967, and deployment in selected States was begun during fiscal year 1968. Deployment and field testing in additional States is expected to continue during fiscal year 1969.

In addition to the 50 States, Puerto Rico, American Samoa, Guam, and the District of Columbia, more than 4,300 political jurisdictions, covering about 87 percent of the U.S. population, submitted annual program papers and related semiannual progress reports in fiscal year 1968.

Increased Readiness Information System (IRIS).—Studies and experiments to determine the control requirements for the operation of civil government in an emergency were initiated in fiscal year 1966 and continued in fiscal years 1967 and 1968. A successful full-scale test of the system, including participation by 48 States and nearly 900 local governments, was conducted during the October 1967 civil defense exercise, CDEX-67. IRIS, which resulted from these studies, experiments, and the test in CDEX-67, serves as a base for decision-making by key national officials concerning increased readiness actions by State and local governments during periods of increased tension. In addition, the system provides significant information concerning public response to these activities throughout the Nation.

The system has been designed for State and local reporting of information each evening during periods of increased tension. The information is relayed to State, Regional, and National officials by the next morning.

Policy and Operational Guidance

Federal Civil Defense Guide (FCDG).—The standard OCD publications medium for issuing official civil defense policy and operational guidance to State and local governments, to other Federal agencies—including the military services—is the Federal Civil Defense Guide. This publication brings together the results of applicable Office of Civil Defense research programs and operational analyses. The Guide conveys Federal policy, and guidance on operational systems and techniques for practical application in Federal, State, and local civil defense programs. Various other OCD publications of an operational nature are keyed to the Guide. During fiscal year 1968, 20 FCDG issuances, and two publications keyed to a specific part of the Guide were prepared and distributed.

Among subjects covered in the new FCDG issuances were: (1) "Actions for Increasing Local Government Civil Defense Readiness," including a checklist of local increased readiness actions, and 19 appendices, each covering a separate readiness area, (2) "Civil Defense Rescue Trucks and Equipment," (3) "Civil Defense Emergency Highway and Street Signs," (4) "Fallout Shelter Medical Kit," (5) "Fallout Shelter Sanitation Kits," (6) "Civil Defense Emergency Operations Planning," (7) Executive Order 11810, "Assigning Emergency Preparedness Functions to the Attorney General," (8) Local Civil Defense Program Papers and Progress Reports (For Fiscal Year 1969), (9) Fiscal Year 1969 Program Emphasis.

Other Technical Assistance and Guidance

Tests and Exercises.—A National Civil Defense Exercise, CDEX-67, conducted in the fall of 1967, was designed to exercise the concepts expressed in the National Civil Defense Emergency Operations Plan and the supporting Continuity of Operations Plan. Emphasis was placed on field testing of the Increased Readiness Information System for preattack emergency operations, and of a recently revised system for damage reporting from local governments to State and Federal levels during an immediate postattack period. The exercise also provided an opportunity for the review of concepts related to Federal support, civil and military, of State and local governments in emergency situations.

Thirteen Federal agencies took part at the national level with Federal agency representation at the eight Federal regional centers varying from nine to 12. There was also Federal agency participation at some State and local levels. Forty-eight States and approximately 2,200 local jurisdictions participated.

During the simulated buildup of international tension during CDEX-67, OCD disseminated changes in simulated Defense Readiness Conditions to the Federal establishment and issued increased readiness guidance to State and local governments. As the exercise situation developed, relocation to emergency sites was accomplished. An important innovation in CDEX-67 was the use of computer-developed weapons effects messages for input at local levels. These messages, oriented to 5,000 geographical points in the United States, formed the basis for reporting on assumed nuclear detonations and on fallout conditions, and for making situation analyses and command decisions. Control staffs were used at all levels of the exercise. Some 500 U.S. Army Reserve field grade officers supplemented State and State-area control staffs.

CDEX-67 reemphasized the need for a long-range exercise program designed to enable State and local governments to further develop their emergency operations capabilities. Such a program will be issued early in fiscal year 1969.

The American National Red Cross (ANRC).—The services of the American National Red Cross were available to the OCD in both advisory and operational capacities. The ANRC continued to assist the OCD in providing fallout shelter space in its buildings in accordance with the memorandum of understanding dated August 15, 1962. The ANRC also continued to encourage local chapters to assist in the program.

The ANRC assisted Federal, State, and local governments in developing civil defense readiness. For this purpose, the OCD arranged for an ANRC representative to carry on civil defense liaison work at the national level and for an ANRC consultant to serve at each OCD regional office.

More than 3,600 local ANRC chapters, widely dispersed nationally, continued to train millions of persons in skills essential to civil defense preparedness; e.g., first aid, home nursing, emergency mass feeding, and management of community fallout shelters. In addition, the local ANRC chapters assisted materially in the Medical Self-Help Program and in operational planning and training.

Emergency water supply equipment.—The OCD inventory of emergency water supply equipment consists of 45 equipment units each with 10 miles of 8-inch steel pipe; with supporting pumps, electric generators, purifiers, chlorinators, and storage tanks. The equipment is maintained to assist States and local governments during natural disaster or postattack operations. Total value of the inventory was approximately \$6.5 million at the end of fiscal year 1968. During the year, a test quantity of 8-inch aluminum pipe meeting specifica-

tions which will permit its use with OCD equipment was received for field testing and evaluation.

Fifteen widely dispersed warehouse locations assisted 53 communities in 15 States during drought and water shortages, floods, tornadoes, and hurricanes occurring during fiscal year 1968. (See fig. 15.) Loans included an aggregate of 84 water pumps, approximately 88 miles of 8-inch steel pipe with fittings, and 21 electric power generator units. At the end of the fiscal year, the equipment was still on loan to eight States for use in 19 communities.

National Defense Transportation Association (NDTA).—During fiscal year 1968, joint OCD/OEP briefings were attended by an NDTA official and State civil defense leaders. The purpose of the briefings was to develop prototype plans for controlling the use of local survival resources expected to be in critical supply after a nuclear attack.

NDTA headquarters, through their local chapters, assisted city and county governments in the development of their resource plans, in accordance with the OCD-NDTA general agreement. Operational assistance was offered by the NDTA in fiscal year 1968 emergencies which occurred during the floods at Fairbanks, Alaska, and the civil disturbances in Detroit, Mich.

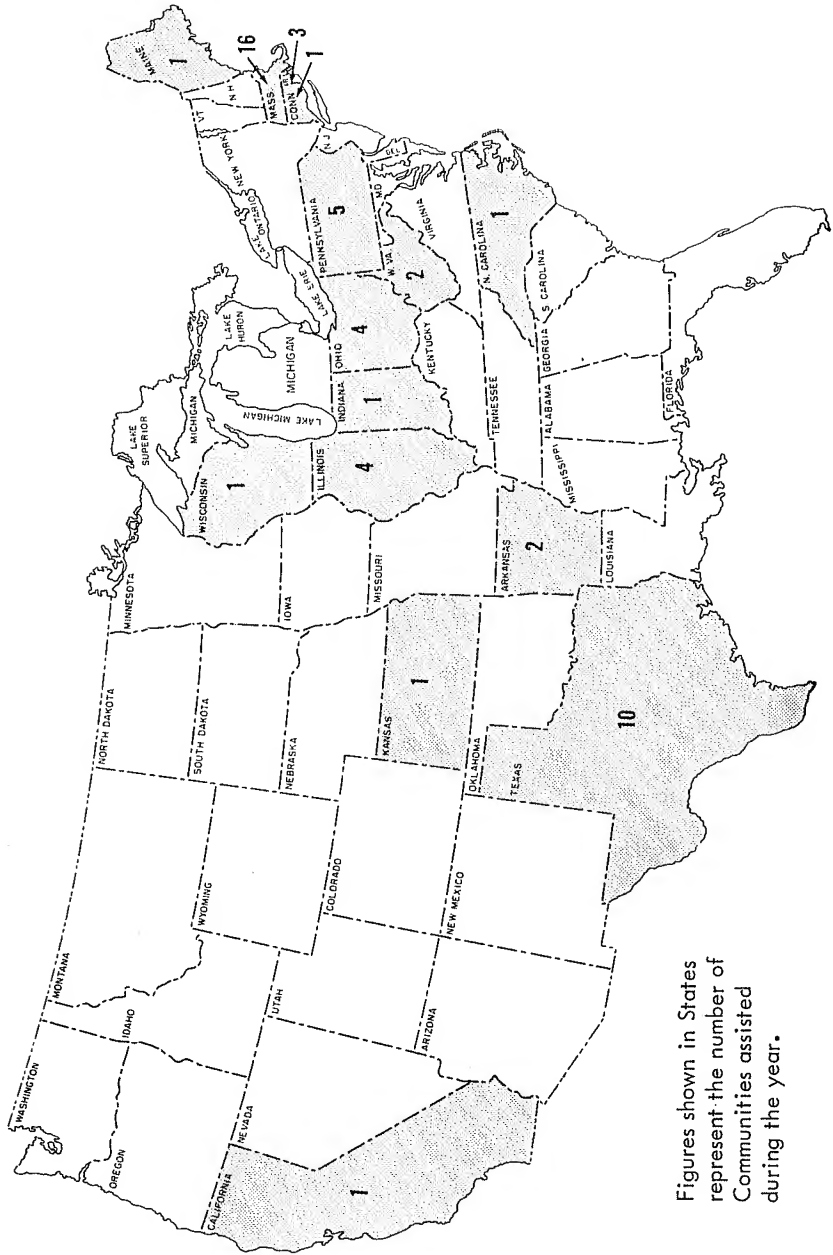


Figure 15.—States loaned emergency water supply equipment during fiscal year 1968.

SUPPORT

An informed public, the cooperation of industry and national organizations, constant program development through research, and a nationwide and worldwide program perspective are important requirements of a successful civil defense program. Major supporting activities that contribute to these ends are discussed in this part of the report.

EMERGENCY PUBLIC INFORMATION

Emergency Public Information activities were directed primarily to planning, preparing, reviewing, evaluating, and issuing information that the public would need in a period of rising international tension. Important by-products and a secondary purpose of these activities were also realized as much of the information was adapted for current use in informing and training the public in survival measures.

New guidance.—During fiscal year 1968, the Office of Civil Defense published new guidance for the general public on nuclear attack and major natural disasters. Distributed in the form of a citizens' handbook on nuclear attack and natural disasters, the publication is titled "In Time of Emergency," H-14. By the end of the fiscal year, 5,235,000 copies had been issued under a controlled distribution procedure. It was also translated to accommodate the Spanish-speaking population: 300,000 copies of the handbook were ordered to be printed for that purpose.

The basic purpose of the 96-page, two-color, 6- by 9-inch handbook is to help people prepare for nuclear attack or major natural disaster, and tell them the best actions to take at such a time. It is intended primarily for use as part of a local government's planned program of providing full emergency guidance to its citizens.

Concerning nuclear attack, the handbook provides emergency information and general guidance that is applicable in all parts of the country. Although this guidance is highly useful in itself, it has added value when used in conjunction with specific civil defense instructions that are issued by many local governments. For example, many communities participating in OCD's Community Shelter Planning (CSP) program arranged to send the handbook to their residents, along with the locally-produced maps and emergency instructions.

"In Time of Emergency" replaced OCD publications "Fallout Protection: What To Know and Do About Nuclear Attack," H-6, and "Handbook for Emergencies," H-3. It also contains much information previously published in the following OCD publications, all of which are out of print: "Emergency Sanitation in the Home," H-1; "Fire Fighting for Householders," H-8; "Home Protection Exercises," MP-1; and "First Aid," L-12.

Immediately following publication of the new guidance material, the OCD began to prepare three mass media information kits featuring the contents of "In Time of Emergency": (1) A newspaper kit containing 10 illustrated articles adapted to newspaper formats, (2) a radio kit containing ten 1-minute spot announcements and six feature-length announcements ranging from 2 to 6 minutes in length, and (3) a television kit containing spot announcements accompanied by illustrations adapted for television presentation. (See fig. 16.) These kits will enable State and local civil defense organizations to disseminate survival information more readily through the mass media available to them.

Community Shelter Planning (CSP).—A major priority during fiscal year 1968 was the guidance provided State and local governments in planning and implementing the public information aspects of community shelter planning.

Federal funds were used to prepare, print, and distribute an emergency information plan for CSP areas. This included the preparation, printing, and distribution of a local publication describing (1) location of public fallout shelters, (2) areas to which specific shelters are allocated, and (3) routes to shelters and means of getting there, and (4) guidance on improvising fallout protection for people for whom public shelter was unavailable or inaccessible.

During fiscal year 1968, the OCD funded CSP emergency public information plans for distribution to 5,000,000 people in 98 local jurisdictions throughout the United States. Of this total, 19 projects were in contract CSP communities, and 79 projects were in noncontract CSP communities. The contract projects represented a total population of 3,500,000, and the noncontract projects represented a total population of 1,500,000.

A model CSP emergency public information workshop was conducted in May 1968, in OCD Region Four, Springfield, Ill. Additional CSP workshops were planned for fiscal year 1969. The purpose of these workshops is to help local civil defense directors and State and local community shelter planning officers effectively and economically develop the emergency public information aspects of community shelter planning.

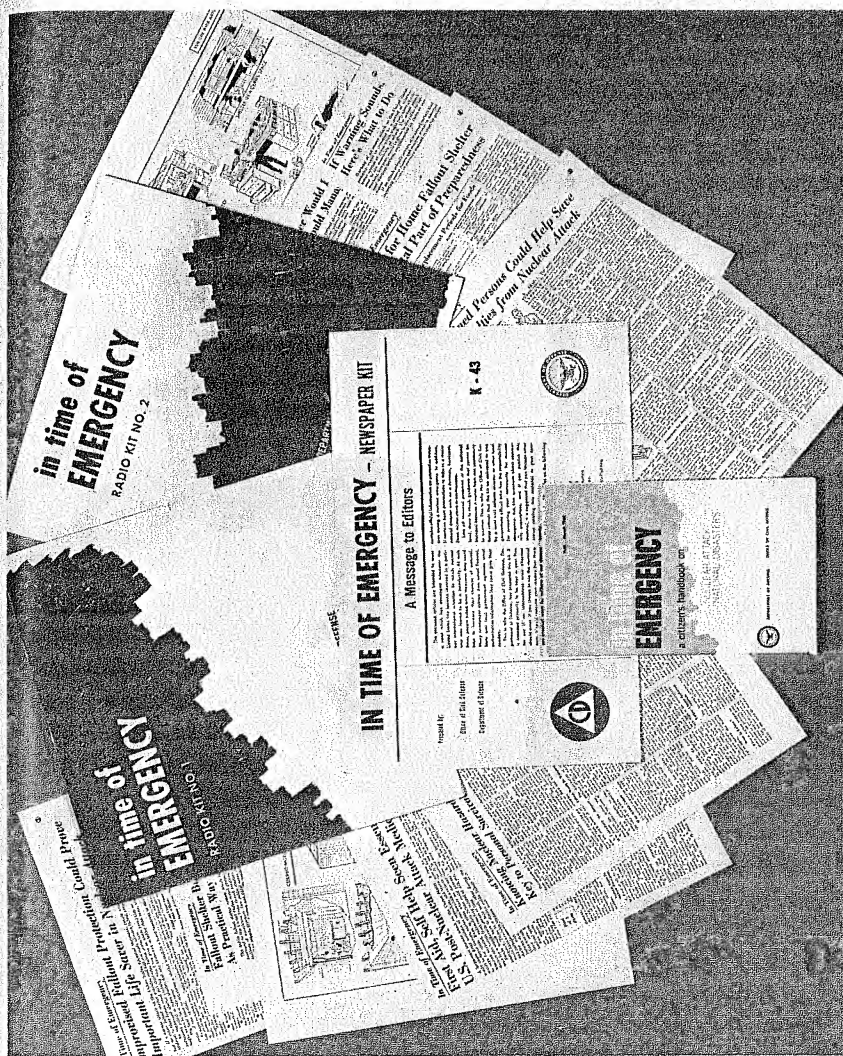


Figure 16.—Mass media information kits.

The CSP model workshop was conducted under contract for OCD by the U.S. Civil Defense Council (USCDC). The USCDC is a non-governmental organization whose members are civil defense directors for counties, cities, and towns throughout the United States.

The same organization conducted Emergency Public Information (EPI) workshops under contract for OCD in Regions Two, Five, and Six during fiscal year 1968. These EPI workshops, part of a series conducted in four OCD Regions the preceding year, were primarily designed to help local civil defense directors identify information resources available to them for use in emergencies. The workshops also demonstrated how to use these resources and highlighted procedures to provide the public with accurate information during emergencies.

Editorial planning support activities.—OCD continued to provide civil defense information support through materials issued as guidance to State and local governments and other organizations, as well as through fact sheets and editorial and illustrative material issued to newspapers, magazines, and other public media. Examples of subjects covered by fact sheets included shelter habitability studies, the Home Fallout Protection Survey, and the construction of Federal regional centers.

The OCD also continued to develop informational material to support the Home Fallout Protection Survey (HFPS). A model information package developed for the West Virginia HFPS continued to be made available to other States planning similar surveys.

During the year, 19 OCD Information Bulletins were issued to transmit information on national civil defense and related military defense policies to State and local governments. In addition, a constant flow of civil defense information to individuals, families, organizations, and public officials was maintained through interviews, conferences, and correspondence in response to individual inquiries.

A publication titled "Status of the Civil Defense Program," MP-46, first developed and released in January 1967, was revised to highlight civil defense information as of April 1968. Designed for quarterly updating, this new publication is distributed upon request to members of Congress, to representatives of newspapers and other communications media, and to the public.

Motion pictures.—Five public information films were released for use in fiscal year 1968, and production began on four others.

The new films released included "It Happened in Texas," a 9-minute documentary report on the hurricane-tornado-flood disaster that struck the Rio Grande Valley in September 1967, and "Port Preparedness," a 23-minute film featuring preparations being made

by American seaports to resume emergency operations following any major disaster. Also released in fiscal year 1968 were three short films on which production had been completed during the previous year: "Slanting," "Once To Make Ready," and "Briefly, About Fallout."

"A Day In September," a 28-minute film about the incorporation of fallout shelter in Federal buildings, was completed and approved for release in August 1968. Films still in the scripting and production stage include the two major emergency information films, "In Time of Emergency" and "Emergency Actions."

A new OCD Motion Picture Catalog, MP-6, was issued in April 1968, adding four new films to the OCD library and deleting 10 others as obsolete. A special brochure, "Three Short Films in Color," promoting "Slanting," "Once To Make Ready," and "Briefly, About Fallout," was prepared and distributed to all television stations.

"Once To Make Ready," an 8-minute film on community shelter planning, received a Festival Honors Award in the 1968 American Film Festival sponsored by the Educational Film Library Association. It is the fifth American Film Festival award OCD films have received in the past 4 years.

The American Association for the Advancement of Science selected two OCD films, "A Hurricane Called Betsy," and "Slanting," for exhibition at the Science Theater during its annual convention in December 1967.

The Army Pictorial Center reported that 33,985 requests for OCD Public Information motion pictures were received by the Army Film Libraries throughout the United States in fiscal year 1968. The three most popular films were: "Though the Earth Be Moved" (The Alaskan Earthquake) with 6,845 requests; "About Fallout," 6,719; and "One Week in October," 4,567.

At the request of U.S. National Archives, a survey and review was made of 417 reels of OCD motion picture film produced in the period between 1951 and 1958. It was determined that 280 reels were obsolete and therefore could be destroyed. The other 137 reels were cataloged and stored at Archives for the historical record and as a possible future source of stock footage.

Radio and television.—Two television announcement kits, "Shelter Stocking" and a revised version of the Emergency Broadcast System announcement, were released to all commercial and educational television stations in the United States. Civil Defense Emblem color slides were also sent to all stations.

A Radio Transcription Kit, containing eight transcribed announcements on the Emergency Broadcast System and nine on general civil defense subjects, with matching live copy, was prepared and distributed to all AM and FM stations.

Final copy was completed and approval received for the production of two Emergency Information Radio Kits, containing 10 transcribed 1-minute announcements and six longer feature announcements, for distribution during fiscal year 1969. Also completed was the 40-frame Storyboard to be produced into television slides, for the use of television stations in conjunction with live copy on the ten 1-minute announcements. (See discussion of mass media information kits in preceding section, "New guidance".)

COMMUNITY SERVICES

Knowledge acquired from various social science research findings together with numerous field activities during fiscal year 1968, resulted in increased understanding and involvement of public and private sector leaders and leadership groups in community action for civil defense. Major emphasis was placed on the development of leadership guidance, program materials, program aids, publications, exhibits, and activities to gain maximum public and private sector active participation at the community level in Community Shelter Planning, the Home Fallout Protection Surveys, and in other civil defense programs.

OCD placed increased emphasis on providing guidance materials for community organizations in developing and applying their resources to support civil defense, especially in community planning and development.

A series of publications for use by community resource groups remained in demand during fiscal year 1968. The H-11 series includes "Community and Family Service for Civil Defense," H-11; "Community Involvement in Civil Defense," H-11A; "Committees for Community Shelter Planning," H-11-B; and the four volumes of "Meetings That Move," H-11-1, 2, 3, and 4, using the seminar workshop technique to enlist support of community organizations. This marked the 5th year of expansion and distribution of the H-11 series since the publication of "Community and Family Service for Civil Defense," in February 1964. Nearly a quarter of a million of these publications were distributed during the fiscal year, making a cumulative total of 2,360,000.

New publications prepared during the year for use by community resource groups include "Meetings That Move," Vol. 5., on "Community Action for Civil Defense," H-11-5, which contains educational program materials for community associations, organizations, and other groups in gaining civil defense support.

Additional publications prepared during fiscal year 1968 include "Community Action for Civil Defense—Leader's Guide," H-11-K1; "Community Action for Civil Defense—Participant's Workbook," H-11-K2; and "Community Action for Civil Defense Slides for Leader's Guide," H-11-K3. These publications contain materials for use in a one-day workshop for civil defense directors and other leaders to help them improve their management and coordinating skills in promoting civil defense community action.

An H-11 series publications holder was devised and distributed during April 1968. Since that time, more than 304,000 holders have been requested by regional, State, and local civil defense organizations.

Liaison and coordination activities.—OCD delivered more than 200 briefings to members of the Congress or their staffs. The briefings concerned awards of CSP contracts in their States or districts, impending HFPS programs in the various States, reports on Federal matching fund grants and on civil defense activities in the States and districts, and other types of information.

OCD also provided national organizations and Federal agencies with policy guidance and coordination. Mutual interest policy and planning discussions with the Department of Health, Education, and Welfare were initiated by OCD. This included a National seminar on Civil Defense Emergency Welfare Services sponsored jointly by OCD and DHEW and attended by more than 100 State public welfare and civil defense officials, representatives of local public welfare and civil defense agencies and nongovernmental welfare associations. The major purpose of the July 1968 seminar was to explore more effective ways of developing civil defense emergency welfare services in every State and community. Six workshop groups discussed the role of Emergency Welfare Services in the shelter program and in government emergency operations, the use of community resources including voluntary agencies, and the training of personnel.

OCD also worked with DHEW in the production of two major exhibits titled "Emergency Health Services" and tabletop exhibits on the same subject for use in the field.

In addition, a "Shelter in Schools" unit display was produced as a companion piece for the Office of Education's "Schoolhouse in the City" exhibit which had a full year of continuous showing throughout the country.

The Home Fallout Protection Survey (HFPS), conducted in 23 states during the fiscal year received support from 26 national organizations. Working at the State level, these organizations encouraged members to support the civil defense HFPS by returning the survey form promptly and encouraging their friends to do likewise. National

organizations participating in this support were: The American Red Cross, the Air Force Association, the American Legion, the American Legion Auxiliary AMVETS, the Benevolent and Protective Order of Elks, the B'nai B'rith, the B'nai B'rith Women, the Catholic War Veterans, the Disabled American Veterans, the Fraternal Order of Eagles, the Future Farmers of America, the Future Homemakers of America, the General Federation of Women's Clubs, the Jewish War Veterans, the Kiwanis International, the Lions International, the Loyal Order of Moose, the National Council of Catholic Women, the National Exchange Club, the National Grange, the Reserve Officers Association, the Veterans of Foreign Wars, the Ladies Auxiliary to the VFW, the Veterans of World War I, and the Zonta International.

Exhibits and related items.—OCD exhibits were placed for viewing by potential audiences estimated at 40 million persons. Exhibits were displayed at numerous locations throughout the Nation including 28 national conventions, regional and State fairs, home shows and expositions, airports, State Capital Buildings, city halls, and other public buildings. The exhibit "Adapting to Living in the Nuclear Age," was on long-term display at Riverside City Museum, Calif.; Center of Science and Industry, Columbus, Ohio; Seattle Science Center, Seattle, Wash.; Bakersfield Museum, Calif.; and in Santa Ana, San Bernardino, and Costa Mesa, Calif.; Austin and Fort Worth, Tex.; and the Fallout Shelter Museum Exhibit at the Municipal Auditorium, Mobile, Ala.

A new exhibit, "Maintaining Life in a Hostile Environment," is being installed at the Center of Science and Industry, Columbus, Ohio, after a premiere display at the Smithsonian Institution and a showing at the Pentagon in Washington, D.C. (See fig. 17.) A duplicate of this exhibit is on display at the Los Angeles Museum of Science and History. The Los Angeles Museum has had a constant display of OCD exhibits for the last 4 years.

This exhibit presents the achievements of science and industry in supporting human life in outer space, in the jet stream, and in the ocean depths. It covers the method of life support in the presence of radioactive fallout, and it also points up meeting life maintenance problems in the presence of hurricanes, tornadoes, tidal waves, floods, and major industrial disaster.

The exhibit contains some unusual techniques and reflects the highest standards of typographic and three-dimensional animated communication. Comprised of "island" units, it occupies from a minimum of 2,300 square feet to a maximum of 3,000 square feet.

Other exhibits produced during fiscal year 1968 include "Shelter in Schools," "Architectural Awards," "Emergency Operating Centers

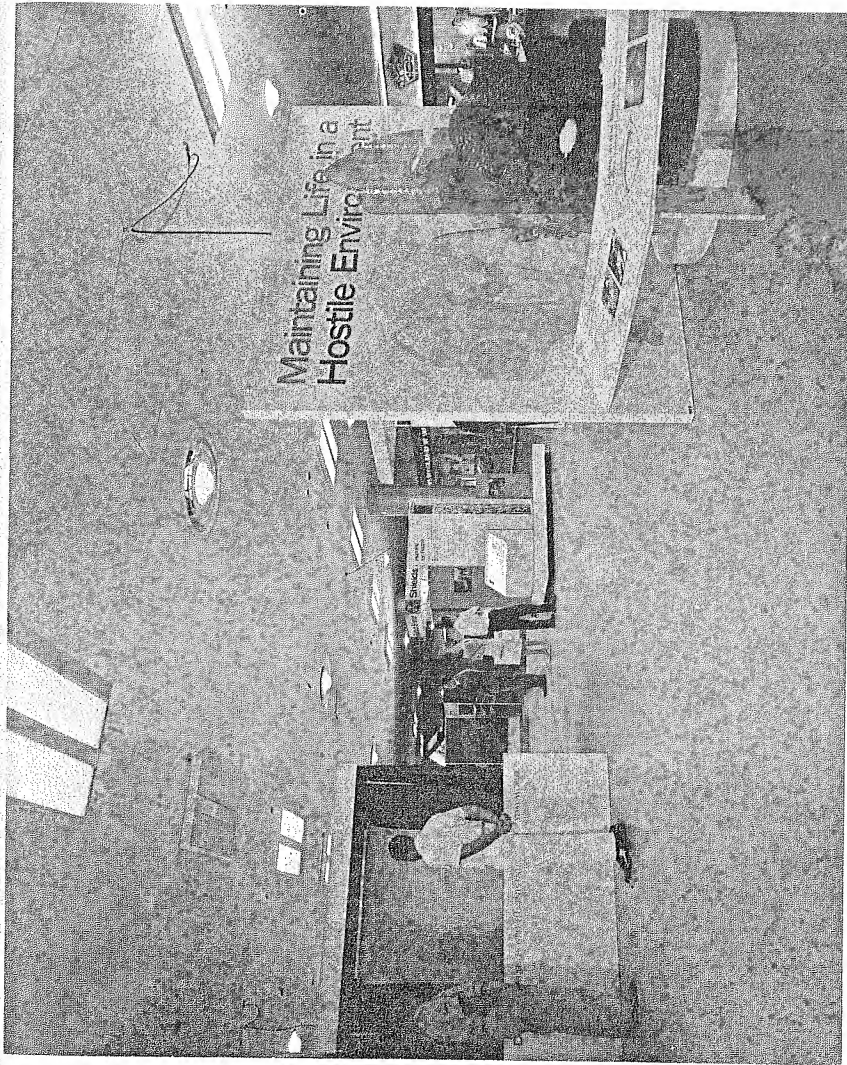


Figure 17.—OCD exhibit.—Maintaining Life in a Hostile Environment.

and Operations," and 15,000 tabletop displays titled "Shelter Stocking." In addition, 3,000 tabletop exhibits titled "Meeting the Needs of People in Emergency" were reprinted, and 40 literature display racks were produced for use with all major exhibits and by OCD regional offices. A total of 1,450 each stand-up and wall-type publication stands also were produced.

Distinguished Service Citations.—These citations were awarded to cities or counties that had stocked fallout shelter space for all or more than their resident population. During fiscal year 1968, in recognition of this accomplishment, 20 areas were awarded the citation. These areas provide stocked shelter spaces for a total of 2,462,065 persons. Since fiscal year 1964, 55 areas have been awarded this citation, for providing stocked shelter spaces for 4,189,808 persons.

TECHNICAL LIAISON

During fiscal year 1968, review of OCD policies, plans, programs, and executive actions was continued to enhance technical and scientific validity of agency activities. To assure broad consideration and full coordination in problem areas of an agencywide nature, extensive use was made of informal ad hoc groups of staff members from organizational components having a major interest in and responsibility for resolving the problem. Attention was given to such subjects as shelter ventilation, shelter water supply and sanitation, shelter classification and marking, radiological information requirements and system planning, orientation and training for waterworks and other service industry personnel, fire vulnerability analysis and evaluation of the National Civil Defense Exercise (CDEX-67).

Monitoring of the activities of the National Academy of Sciences/National Research Council related to civil defense was continued. Guidance was provided to the expanded Advisory Committee on Civil Defense and the Committee on Fire Research, and participation by OCD staff specialists was coordinated. In addition to active subcommittees of the Advisory Committee on Civil Defense covering radiation shielding, fallout phenomena, protective construction, blast and thermal effects, and organization and operation of civil defense systems, a subcommittee was formed to study civil defense concepts and strategies.

Activity was continued in the correlation of operational program requirements and research activities, as well as in the utilization of research findings and new technical data in agency program improvement.

INDUSTRIAL PARTICIPATION

Through industrial participation activities, OCD continued to furnish managers of industrial and commercial enterprises with information and guidance on civil defense preparedness in their facilities. Preparations for the protection of life and property during civil defense emergencies included those designed to (1) protect industrial personnel and facilities, (2) preserve production or service capabilities, and (3) assist the local government or community in its civil defense efforts.

The OCD worked in liaison with Federal agencies and industry to help business and commercial establishments achieve these objectives. The fiscal year 1968 pattern of operations, similar to that followed in recent years, resulted in increased development and dissemination of industrial civil defense information. Conferences, seminars, the Industrial Civil Defense Management Staff College courses, and other training activities were widely used to guide and instruct industrial leaders and their key executives in civil defense preparedness procedures. Liaison with home offices of multiplant firms helped to expand and strengthen the nationwide public fallout shelter system.

The OCD provided leadership and guidance to various Federal agencies having responsibility assigned by Executive Orders for promoting industrial facility preparedness programs. This included coordination of their civil defense publications and assurance that their activities were consonant with OCD plans, programs, and operations. Industrial civil defense guidance materials were disseminated through Department of Defense (DoD) components that work with industrial firms in the DoD industrial defense programs.

Information and guidance material.—Federal agencies, with OCD encouragement and assistance, continued to develop and distribute civil defense information and guidance materials adapted to the needs of those industries with which they conduct business regularly. Altogether about 425,000 copies of industrial civil defense publications applicable to business and industry were distributed through State colleges and universities, State and local civil defense offices, other Federal agencies, individual companies and business firms, and national professional and trade associations during fiscal year 1968.

OCD encouraged dissemination of civil defense information by industrial and commercial firms to inform and educate their employees in methods of personal and family survival and urged these organizations to coordinate their efforts with the State and local civil defense office. Many business and industrial firms continued to inform and educate their employees and stockholders by civil defense information.

in their magazines and news media. Among companies cooperating with local governments in informing and educating the public in survival methods were Western Electric, McDonnell-Douglas, Jones and Laughlin, International Business Machines, Alcoa, Pittsburgh Plate Glass, General Electric, Chase Manhattan Bank, Humble Oil, Shell Oil, American Electric Power, Aerospace Corporation, and numerous others.

An important publication titled "Emergency Preparedness Guidelines for Credit Unions," prepared by the U.S. Department of Health, Education, and Welfare, Social Security Administration, Bureau of Federal Credit Unions, in cooperation with OCD was distributed during the fiscal year. This 39-page publication was designed to assist credit union officials in making emergency plans appropriate for their particular credit union. It contains specific information on credit union financial emergency responsibilities and actions, personnel protection, continuity of operations, and records preservation. A detailed description of the Nationwide Records Preservation is included. Some 55,000 copies were distributed to credit union officials during the year.

Another booklet titled "Emergency Operations Guide for the Natural Gas Transmission and Distribution Industry," prepared by the Emergency Advisory Committee for Natural Gas at the request of the Department of the Interior, was reprinted by OCD. This 51-page booklet with a multicolor foldout map of the pipelines in the United States was prepared to assist the gas industry in its preparations to continue to supply gas during a national emergency, including nuclear attack. Approximately 10,000 copies have been supplied to officials of the gas transmission and distribution industry, and other industries needing this type of guidance.

Documentary motion pictures produced in previous years were widely used by State and local civil defense directors during the fiscal year. Especially well received were "Port Preparedness," which shows civil defense preparedness in four U.S. ports; "Memorandum to Industry," about industrial civil defense preparations in well-known U.S. corporations; and "Mutual Aid, the 'Us' in Industry," which shows how one industrial mutual aid association operates.

An industrial exhibit titled "When You Build . . .," showing how to include fallout protection in design of new industrial structures, was displayed at industrial CD and other national organization meetings during fiscal year 1968. In addition, a smaller industrial exhibit titled "Business and Industry Provide Dual-Use Fallout Shelter in the Design of New Construction," showing a building containing dual-use shelters and two table top displays titled "Industrial Civil Defense" and "Industry Prepares for Emergency Operations," were also displayed during the year.

Approximately 30,000 business, professional, educational, and other civic leaders obtained civil defense guidance and information through industrial civil defense conferences, seminars, and training sessions conducted primarily for civil defense purposes. These included two classes in Industrial Civil Defense Management offered at the OCD Staff College and at conferences and meetings conducted by 111 State and local governments. Sponsors of the conferences and seminars included State industrial commissions and associations, universities, chambers of commerce, professional organizations, civil defense officials, and various Federal, State, and local government offices. These meetings were held at 40 locations throughout the Nation. The OCD provided civil defense information and guidance materials and by request, participated directly in the conferences as keynote speakers or panel moderators. Many guest lecturers from business and industrial firms told about their company civil defense plans.

OCD continued to work with major national organizations in disseminating civil defense information and guidance materials to industry. Among the organizations were the U.S. Civil Defense Council, the Chamber of Commerce of the United States, the National Association of Manufacturers, the American Society of Association Executives, the American Iron and Steel Institute, the Association of Land-Grant Colleges and Universities, the American Society for Industrial Security, the National Safety Council, and the National Machine Tool Builders Association.

More than 3,800 military officers and key industrial and civic leaders who attended National Security Seminars conducted by the Industrial College of the Armed Forces in seven metropolitan areas heard lectures about civil defense and industrial readiness and obtained civil defense material provided by the OCD. Courses conducted for industrial executives in government and industry by the U.S. Army Military Police School, Fort Gordon, Ga., continued to provide civil defense information and guidance materials.

Shelter development.—The OCD, through direct liaison with multi-plant industrial or business concerns, continued to encourage adoption of corporate fallout shelter policies favorable to expanding and strengthening the nationwide fallout shelter system.

All conferences and seminars, as well as liaison activities with industry, presented the nationwide fallout shelter system as the nucleus of a balanced civil defense program. During fiscal year 1968, major firms in most categories of industry and business continued to cooperate with OCD in these activities. Consequently, licensed public fallout shelter spaces in industrial establishments as well as dual-use shelters in new or modified buildings were substantially increased.

LABOR SUPPORT

In response to OCD liaison with labor and trade unions, these organizations continued their enthusiastic support of civil defense during fiscal year 1968, particularly in the area of labor leadership training. Some major examples of this support follow.

1. Labor civil defense seminars were attended by 3,520 labor leaders during the year, resulting in a cumulative total of 10,269 labor leaders throughout the United States trained in the 1¼-hour course titled "Labor's Supporting Role in State, County, and Local Civil Defense."

2. Leadership in the Postal Services responded by training 880 members in the 1¼-hour course, "Labor and the Postal Worker in Civil Defense." This brought the number of key postal union officials so trained to a cumulative total of 1,715.

3. As a result of the labor leadership training seminars, 40,050 copies of the labor civil defense 10-point manual "How Does This Affect You?," have been distributed to labor officials throughout the Nation. In addition, 30,050 copies of the Spanish translation of the manual were distributed to Puerto Rican labor groups. Approximately 363,000 of these 10-point manuals have been distributed since it was first prepared in 1966.

4. A new 8-point exhibit depicting Labor's participation in civil defense was viewed by 206,734 persons at the AFL-CIO Union-Industry Show, held in Philadelphia, Pa. Each exhibit viewer received a new leaflet titled "Labor's Part In Civil Defense." The Philadelphia civil defense office displayed a shelter locator exhibit which indicated the location of every fallout shelter in the city of Philadelphia. The exhibit space was donated to OCD by the AFL-CIO.

5. The AFL-CIO Ladies Auxiliaries affiliated with the Postal Service Unions continued to show increasing interest in the Labor Civil Defense Seminars. Members of auxiliary chapters attended seminars in McAlester, Okla., Laramie, Wyo., St. Cloud, Minn., and Jackson, Mich., during fiscal year 1968.

INTERNATIONAL ACTIVITIES

Exchange of information with friendly nations and mutual civil defense planning were the principal international activities of the OCD during fiscal year 1968. In coordination with the Office of the Assistant Chief of Staff for Intelligence (DA) and the Department of State, these activities were conducted cooperatively with the North Atlantic Treaty Organization (NATO), the Central Treaty Organiza-

tion (CENTO), and the United States/Canada Joint Civil Emergency Planning Committee (CEPC).

The OCD participated in the September 1967 meeting of the NATO Civil Defense Committee in Paris. Enroute to the Paris meeting, the OCD Director met with civil defense officials in London to discuss developments in emergency communications facilities. In addition, an OCD official was designated by NATO as the technical rapporteur for an ad hoc study group on shelter design techniques. OCD was also represented at a Symposium on Radiological Protection of the Public in Nuclear Mass Disasters, held at Interlaken, Switzerland, May 21-June 1, 1968.

In January 1968, the OCD Director and representatives of the American Institute of Architects presented a first honor award certificate and plaque to the Ambassador of the Netherlands for the incorporation of effective and economical dual-use fallout shelter space in the new Netherlands Chancery in Washington, D.C.

The OCD assisted the Department of State in preparation of United States position papers for use at meetings of the NATO Senior Civil Emergency Planning Committee and its working party.

An official of the Civil Emergency Planning Directorate of NATO, and representatives from Australia, Brazil, Canada, Denmark, Iceland, Korea, Laos, Norway, Pakistan, Philippines, South Africa, Sweden, Switzerland, Thailand, and the United Kingdom were among the 41 foreign officials from 16 countries who visited the OCD during fiscal year 1968. In connection with their OCD visits, four civil defense officials from Canada and one from Thailand also attended courses at the OCD Staff College.

NATO and CENTO member countries were supplied with OCD Information Bulletins and technical publications, as well as the OCD annual report for fiscal year 1967. In response to a total of 302 requests, certain OCD publications were sent to 40 countries. Four new OCD motion picture films were furnished to NATO and CENTO civil defense libraries for loan to member nations. These and other films were either loaned to or purchased by the Governments of Australia, Austria, Belgium, Brazil, Canada, Denmark, France, Greece, Iceland, India, Israel, Malta, Netherlands, Pakistan, Portugal, Scotland, Switzerland and The United Kingdom.

The Civil Emergency Planning Agreement between the United States and Canada was renewed on August 8, 1967. The U.S./Canada Civil Emergency Planning Committee, formerly designated the U.S./Canada Joint Civil Emergency Planning Committee (JCEPC), met in Washington, D.C., on September 14, 1967. OCD officials maintained and strengthened, with their counterparts in the Canada Emergency Measures Organization, the close working-level cooperation prescribed in the agreement.

RESEARCH AND DEVELOPMENT

Research by the Office of Civil Defense has as its purpose the production of information that will enable planners and policymakers to improve the effectiveness and efficiency of civil defense programs. To fulfill this purpose, the best available scientific knowledge and principles are applied to the solution of civil defense operating problems. This program is carried out principally through contractual agreements with government, educational, and private research organizations.

Research program planning establishes goals believed to be consistent with information needs. The program emphasizes systems evaluation and the necessary supporting applied research. A part of the effort supports currently approved programs, but most is directed toward an improved capability for estimating the cost, effectiveness, and feasibility of alternative civil defense systems of the future.

Three basic types of future civil defense have been under study: (1) Systems similar to the current civil defense posture that offer substantial improvement yet lie within the general framework of present national security policy, (2) systems designed to provide a high degree of protection against attacks on urban populations, and (3) systems designed to alter the vulnerability of population and resources by actions taken during a period of deteriorating international relations.

Systems of the first type, as "near neighbors" of the currently approved programs, are being given priority attention, especially in connection with the deployment of the SENTINEL ballistic missile defense. Emphasis is on the possibility of "slanting" new construction in cities for added protection against blast and fire effects as well as fallout. Experimental and analytical work of the past several years indicates that blast and fire slanting may be done at a cost not greatly exceeding that of fallout slanting. More extensive information on the scope and character of blast damage and fire growth and spread is being used to develop improved capabilities for emergency operations, such as firefighting, rescue, and treatment of injured survivors. The effect of the SENTINEL deployment on the scope and effectiveness of civil defense is also under study.

A major area of study continues to be the question of this country's viability following nuclear attack. As increased protection is assumed for the population, resource protection must also be provided if per capita surviving resources are to remain constant. Prior years' investments in this difficult area of study are beginning to yield results. An immediate goal is the capability of measuring the effectiveness of civil defense and other strategic defense systems not only in terms of added survivors, but also in terms of per capita income one or two years after attack. This work is being done in conjunction with the Office of Emergency Planning.

Selection of the most capable contractors, along with careful screening of proposed studies, have resulted in some noteworthy achievements described elsewhere in this report. Following are percentages of funds committed to the various research groups during fiscal year 1968 and previous years:

	Percent	
	Fiscal years 1962-67	Fiscal year 1968
Department of Defense (DoD).....	16. 5	12. 6
Federal agencies, exclusive of DoD.....	11. 1	9. 0
Educational institutions.....	9. 4	13. 4
Private organizations, including industrial laboratories, research institutes and foundations, and quasi-government agencies.....	63. 0	65. 0
Total.....	100. 0	100. 0

Functional categories.—In fiscal year 1968, 93.3 percent of the available \$7.1 million was programed for research in four functional categories. The balance was used to obtain technical advisory management and support services from lead laboratories to aid in managing selected areas of research. (See table 11.) The breakdown of funds for research and service follows:

TABLE 11.—Research funds programed and obligated fiscal year 1968 appropriations

Type of research (category and project)	Programed	Obligated
Total.....	\$7, 100, 000	¹ \$7, 068, 999
Shelter.....	2, 220, 000	2, 093, 321
Protection studies.....	1, 113, 000	1, 016, 000
Shelter environment.....	350, 000	348, 433
Subsistence and habitability.....	20, 000	20, 000
Component development.....	160, 000	153, 929
Shelter management.....	280, 000	262, 195
Shelter systems.....	297, 000	292, 764
Support systems.....	1, 695, 000	1, 734, 426
Monitoring systems.....	30, 000	74, 781
Communications and warning.....	155, 000	155, 430
Reduction of vulnerability.....	40, 000	40, 000
Emergency medical research.....	335, 000	495, 241
Fire effects and protection.....	780, 000	615, 000
Emergency operations.....	355, 000	353, 974
Postattack.....	1, 410, 000	1, 478, 708
Radiological phenomena and effects.....	475, 000	420, 000
Radiological countermeasures.....	245, 000	245, 589
Repair, reclamation of damage.....	150, 000	200, 000
Postattack medical, health, and welfare.....	120, 000	162, 700
Recovery and maintenance systems.....	420, 000	450, 419
Systems evaluation.....	1, 300, 000	1, 287, 544
CD systems analysis.....	810, 000	818, 055
Strategic analysis.....	0	0
Vulnerability and requirements.....	110, 000	110, 000
Organization and training.....	0	0
Planning support.....	35, 000	18, 004
Information systems analysis.....	0	0
Physical environment studies.....	0	0
Social and psychological.....	345, 000	341, 485
Management and support.....	475, 000	475, 000

¹ Does not include prior year funds obligated in fiscal year 1968.

	Percent
Shelter	31.3
Support systems.....	23.9
Postattack	19.8
Systems evaluation.....	18.3
Management and support services.....	6.7
Total	100.0

For the past 3 years, a significant research effort has involved a comprehensive analysis of hypothetical attack effects and effectiveness of civil defense countermeasures. Through a system of coordinated studies in each of the four research categories, using assumed attacks on five selected urban localities, much technical data are being acquired. This effort promises to improve methods of analyzing attack effects and civil defense planning. It will also provide guidance for establishing future research requirements.

Shelter

Shelter research during fiscal year 1968 has emphasized the subjects of protection from weapons effects, environmental conditions in shelters, low-cost equipment and supplies for in-shelter use, organization and management of large shelters, and potential options for enhancing the chances of survival from the combined initial effects of nuclear weapons.

Radiation shielding experiments and studies have concentrated on those aspects of the shielding methodology most affected by differences between real structures and the idealized schematic arrangement of the methodology. Effects of rough surfaces, limited strips of fallout contamination, and scattered radiation have been studied. To evaluate better the blast resistance of both conventional and special structures, and the protection provided by these structures, wall panels have been subjected to blast overpressure in a special test facility. Test results have been encouraging, and comparison with available theory makes it appear hopeful that they can be extended or applied to other dimensions. Studies of high-velocity air streams through entranceways or other openings are underway to assist in the evaluation of feasible protective measures at moderate blast overpressures.

After study of heat stress problems in shelters, zonal maps for the country were produced showing ventilation rates required for a given reliability of not exceeding various environmental conditions in shelters. Development of simple prototype ventilation devices has kept pace with the environmental studies. Designs of human-powered equipment have been emphasized to increase system reliability in the absence of electric power. Studies of options for water supply, where

municipal supplies are not available, have indicated a cost effectiveness ranking with increasing shelter size, such as stocked water drums, tanks, and wells. Long-term surveillance of shelter foods under controlled conditions has been continued. Good quality and acceptable palatability has continued except under the most adverse conditions.

The largest shelter occupancy study to date—involving 1,000 men, women, and children—was conducted. Emphasis was on problems and methods of organization and management of a large shelter with a number of rooms. The need for revising further a research prototype shelter management handbook, used in earlier studies, became apparent when volunteers had difficulty using it to improve shelter living. New instructions for setting up packaged ventilation kit units were tested with a number of groups. Although these were found to be much more effective than instructions provided previously, volunteers encountered difficulties and made errors. Therefore, development of simpler equipment has been initiated.

The inventory of dual-use shelter options under research study has been expanded to include many options for single-purpose shelter. Considerable selectivity in terms of austerity and protective capability has been included. Study has shown quantitatively how survival can be enhanced through appropriate evasive action on the part of the shelter occupant. A methodology for performing area-wide survival calculations for a wide range of sheltering postures has been improved to show the combined effects of blast and fire. Shelter siting studies of potential shelter options have been conducted in two cities. Availability of desirable shelter sites has been affirmed, and certain cost-sensitive siting factors identified. Other studies thus far have failed to show that underground transportation arteries offer hope of a significant increase in national shelter posture although they may be significant in selected cities.

Support Systems

A study of the radiological information needs of occupants of local shelters was completed during fiscal year 1968. A gamma rate meter which uses transistors instead of vacuum tubes has been designed and built and is being tested. A study of the need for and feasibility of burst sensors has been completed. A study which searches for optimum maintenance patterns and techniques is underway as is a compilation of the theoretical and technical aspects of quantity manufacture of Geiger Mueller tubes. A gamma rate meter which uses a Compton-recoil-effect sensor to cut its power requirements to a minimum has been designed, built, and tested.

A useful, first-generation technique for making engineering evaluations of communications systems capabilities was developed. Using an

actual community as a model, the communications requirements for that community were developed, together with a communications plan. The methodology was then extended to a generalized procedure for deriving communications system requirements. A re-evaluation of the possible use of a variety of unusual communications media was completed. A study of automated information display systems revealed that display requirements need to be assessed in the context of new operations concepts, followed by a cost-effectiveness evaluation of candidate means and techniques to fulfill the requirements.

A study was completed on the various problems associated with warning and movement to shelter in an urban area provided with public blast shelters. Data were presented on the vertical distribution of the working population in two urban business centers dominated by high rise buildings and on the theoretical descent times of the population if a movement to shelter were necessary. An analysis was made of the fundamental variables relevant to the construction of a model for measuring warning effectiveness. An expedient means of using the radio broadcast system during an international crisis for warning was developed.

Reduction of vulnerability studies concentrated on the development of an analytical system for evaluating civil defense countermeasures and on methods for the evaluation of alternative sets of civil defense countermeasure systems for emergency civil defense operations. Damage limitation studies of the aluminum industry indicated that rapid shutdown of plants, while reducing danger to operating personnel, results in costly repairs and prolonged and expensive delays in starting up production after the emergency.

Emergency medical research included continuing studies of austere treatment of burns, trauma, radiation sickness, and other injuries associated with nuclear weapon effects. Analyses of the numbers and types of urban casualties from a high-yield nuclear attack provided data on expected casualties, thus making it possible to estimate the kinds of medical support needed during an emergency. A study was continued describing and comparing the acute and late effects of protracted low dose rate gamma radiation on large domestic animals in terms of injury and recovery, as reflected in lifespan and in hematological and other physiological alterations. Work continued on the possibility of producing an effective non-narcotic, non-addictive, pain-relieving drug.

Work was completed on the development of policy and principles considered necessary in preparation and management of mass casualties by the American Medical Association. Work was also completed on a review of treatment of acute radiation injury under medically-austere conditions.

Studies on fire prevention and control and on methods for reducing personnel casualties and property damage for war-caused fires were continued. An evaluation was made of new concepts for the extinguishment and control of urban mass fires resulting from nuclear weapon attacks. In an experimental investigation of the effect of wind on liquid fuel fires burning in cylindrical containers, dimensionless equations were obtained in terms of Reynolds and Froude numbers. A theoretical model of the burning of cellulosic fuels was developed and experimentally amplified by burning alpha cellulose cylinders, both pure and with inhibitor, and by a study of the chemical kinetics of the cracking reactions of the distillate from potato starch. This showed that the fire retardant material apparently acted as a catalyst in accelerating the weight loss of the treated material leaving a residual weight of char about twice that of the untreated sample. Study continued on the characteristics of mass fires by burning 40 acres of pinon waste wood on the California-Nevada border. An example of special instrumentation developed to analyze these experimental fires is the vector-type anemometer which is capable of measuring all three components of air flow by mounting three fan-type anemometers at right angles to each other. (See fig. 18.) The instrument performed well and withstood high temperatures.

Translations and evaluations were made of some World War II German papers describing fires caused by bombing attacks. A study of mass fire scaling showed that, although rigorous scaling is impossible, approximate mass fire scaling can be used to advantage. The ignition response of blackened alpha-cellulose and cotton cloth, containing fire retardant additives, was compared by exposing the samples to various irradiance levels from a calibrated thermal radiation source. These comparisons yielded further insight into the mechanism of thermal degradation. Similar ignition response measurements made with specimens exposed to ionizing radiation showed that gamma radiation results in ignition retardance of cellulose, while irradiation by neutrons, does not.

Emergency operations research led to the formulation of a "Concept of Operations Under Nuclear Attack," to be incorporated into the Federal Civil Defense Guide in early fiscal year 1969. A study was made of command and control implications of this concept, delineating the approach and methodology used and presenting the results of two major efforts: (1) The study of the command and control authorities, responsibilities, and associated information needs, and (2) an assessment of the role of emergency operating centers in relation to the new concept of operations.

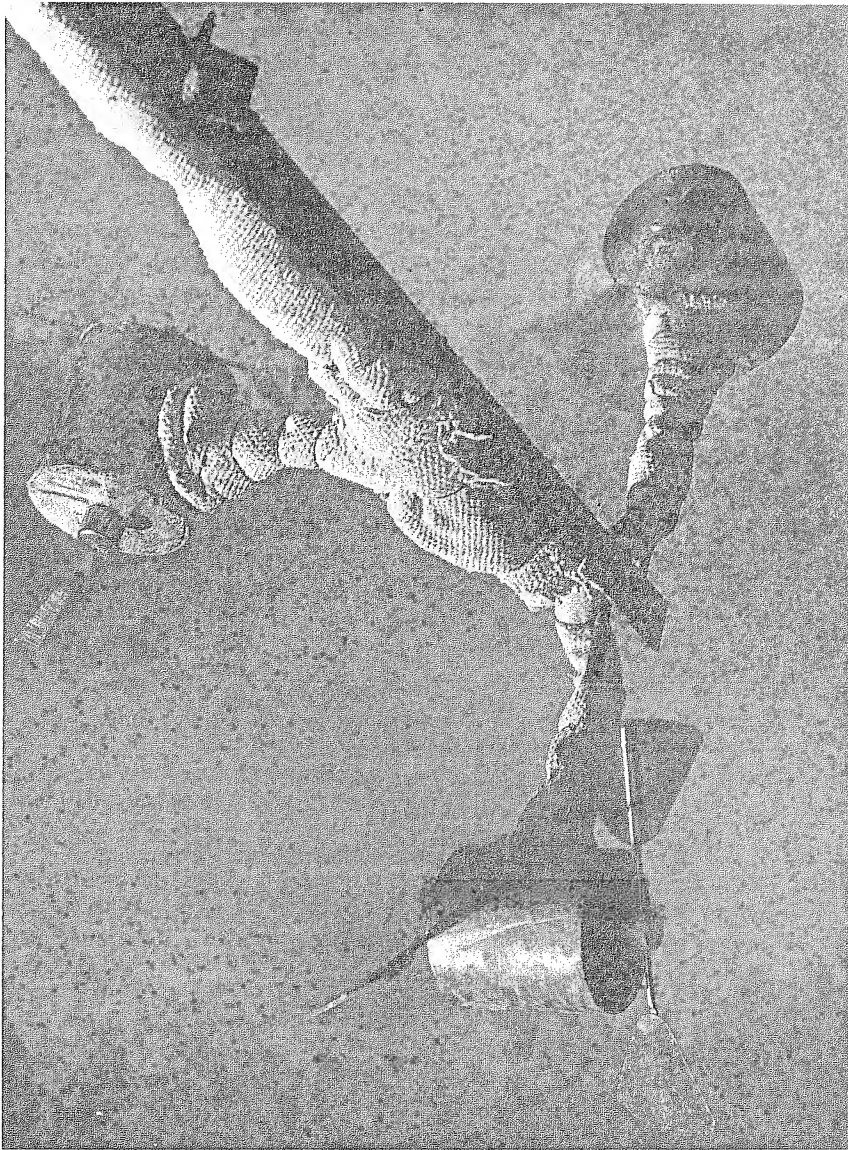


Figure 18.—Vector-type anemometer for measuring air flow.

Disaster research was continued and resulted in the preparation of the first four of a series of reports now under review. Other reports on warning, police, fire, public works, and other entities of concern to civil defense are also in preparation.

Postattack

The techniques and the data base for projecting the longer-range results of hypothetical nuclear attacks continued to be improved during fiscal year 1968. In the OCD Damage Limiting Study, the following factors were analyzed: Food and water availability and radiological contamination levels, availability of effective manpower, relative survival of critical manpower categories—especially management—survival and availability of critical industries, debris production and clearance requirements, decontamination requirements and expected benefits, and overall productive capacity of the surviving economy considering various final demands. In general, the results of such studies show that the per capita production potential of the damaged economy is not appreciably less than the preattack per capita production. That is, the damage to the economy is not greatly disproportionate to the damage to the population. However, these studies spotlight two research requirements: (1) The need for detailed investigation of the critical survival period (up to, perhaps, 6 months postattack); and (2) the need for developing plans and policies, and for training in management skills needed to operate efficiently such a damaged economy. A number of the OCD postattack research units, jointly funded and cooperatively managed with OEP, are aimed at these problem areas.

A computer program for generating fallout contours was developed and used in an experimental exercise to provide a time sequence of map-scale dose rate contours for Florida following a hypothetical attack. This program will be used in Civil Defense exercises to provide more realistic simulation of an actual fallout situation.

Through the use of new computer codes and the application of experimental data, decontamination requirements are now better understood. The amount of decontamination effort as estimated by earlier data and calculations was much greater than estimates based on the newer considerations. The addition of manufacturing capacity through decontamination (mentioned above in the Damage Limiting Study), for example, was relatively unimportant on a national scale. The role of decontamination could be critical, however, for selectively making available essential utilities or the early production of important commodities.

Experimental work on the expected ecological effects of fallout has produced theories for predicting the radiosensitivity of various plants and insects. The sensitivity of plants to fallout gamma radiation, including many important for food crops, appears much greater than previous estimates. This increased gamma sensitivity, plus the added result possible from beta irradiation, implies that the fallout damage to standing crops after a nuclear attack would be widespread.

Research on the possibility of certain diseases becoming epidemic has included individual examination of the various candidate diseases as well as a systems analysis of the health procedures for coping with them. The conclusions were that the postattack threat of diseases such as plague, typhus, and encephalitis would not be national in scope, although the threat might be serious locally under certain damage conditions. No unusual or expensive measures, however, appear warranted since normal inventories for control appear adequate. The main requirement would be that survivors receive directions for control measures when necessary.

Systems Evaluation

This research attempts to integrate all OCD research systems studies into a framework of comprehensive total civil defense systems and to develop the means for evaluating these total systems. For study purposes, the civil defense systems involved are divided into local systems and national systems. In order to evaluate those systems which will minimize loss of life and property and increase the capability of our country to recover from an enemy attack it is necessary to consider not only the systems themselves, but also other factors such as the following: (a) Relationships with other defensive systems, such as Sentinel; (b) inter-actions between the threat and the system; and between the system and the nation or locality; and (c) intra-actions among people, resources and institutions, under various constraints associated with different systems alternatives.

During 1968, national system studies were pursued using two bases of unit areas, counties and standard metropolitan statistical areas. Using available data, a rapid system of depicting the geographic makeup of the country with respect to its people, institutions and resources was developed, so that changes in makeup caused by various combinations of assumed attacks and civil defense countermeasures could be described. The bulk of this work has dealt with the basic elements required in structuring the system rather than how they are linked together. However, one notable accomplishment during the year was the completion of an economic interaction model showing schematic linkages for 80 sectors of the country's economy. It was designed to be compatible with the geographic model.

An in-depth study of a local civil defense operating system was completed using Detroit's present system as a prototype. Applying methods developed in a 1968 analysis of the vulnerability of utility, production, and distribution systems of San Jose, Calif., and Albuquerque, N. Mex., the city of Detroit can now be studied for the interactions between the civil defense system and a given resource element,

Research in the social sciences continued to stress the relationship of the public and civil defense systems in the "preparational period." A detailed study was made of the Home Fallout Protection Survey program currently underway. This survey showed a very favorable public response and a significant improvement in the public's technical knowledge of civil defense.

One important study completed in fiscal year 1968 concerned the difficult problem of vulnerability of institutions. A useful framework for future studies at the national level was produced by this work. Other specialized research completed in the fiscal year included the development of a technique for analyzing information flows within the present civil defense communication system and an outline method for statistically predicting, by computer, enemy targeting intentions from early attack reports. The threat potential of chemical and biological agents was the subject of continuing research evaluation.

TRAINING AND EDUCATION

During fiscal year 1968, the OCD continued training and education activities designed to support civil defense operations nationwide at all levels of government and to provide civil defense education to the public. This included the instruction of key leaders in planning and directing civil defense operations, the training of personnel in skills needed in civil defense emergencies, and the education of the public in civil defense. The preparation of suitable training materials, as well as actual instruction, was also continued as a basic part of training and education activities.

Fiscal year 1968 progress in major training and education activities is described in this section of the report. Federal financial support of OCD-approved State and local training activities was closely related to this work.

Professional and Technical Training

Throughout fiscal year 1968, the principal means of providing civil defense professional and technical training included the OCD Staff College, the Civil Defense University Extension and the Civil Defense Adult Education Programs, and the facilities of various Army posts. In addition, OCD-produced training materials were used by local governments to train in the areas of police, rescue, and radiological defense.

OCD Staff College.—Federal, State, and local civil defense personnel, industrial executives, educators, urban planners, military support personnel, and others trained at OCD Staff College, Battle Creek, Mich., totaled 1,123 for fiscal year 1968. (See fig. 19.) This brings the

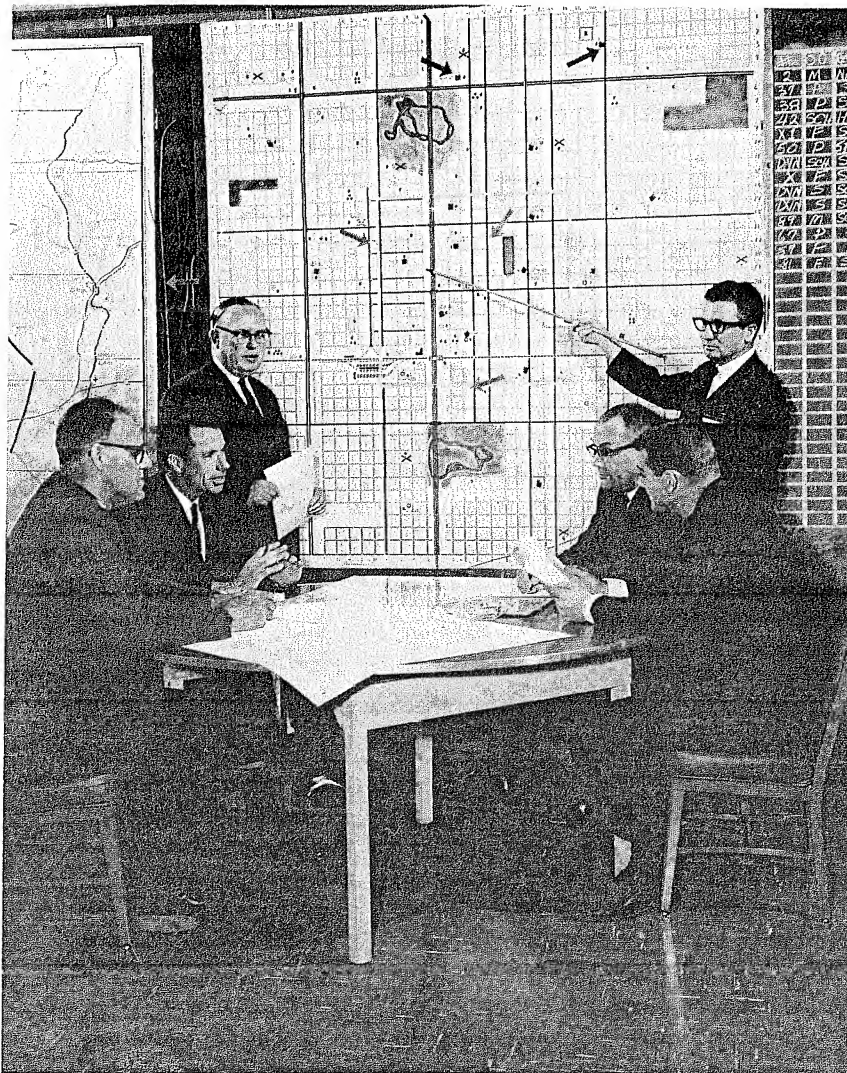


Figure 19.—OCD Staff College Training for Civil Defense Planning and Operations.

number of OCD graduates since fiscal year 1951¹ to a cumulative total of 52,169.

The 41 courses offered during fiscal year 1968 included Civil Defense Management, Industrial Civil Defense Management, Shelter Management Instructors Workshop, Civil Defense Management Workshop, Military Support of Civil Defense, Radiological Defense Officer Work-

shop, Civil Defense Adult Education Seminar, Civil Defense Planning and Operations (Courses I, II, and III), and Community Shelter Planning (separate courses for urban planners, local officials, and non-contract areas).

In addition, a special course was presented for the continuing professional development of the OCD Regional Field Officers, an advanced Civil Defense Seminar was conducted on Emergency Communications, and a special Damage Estimation course was conducted primarily for OCD regional personnel.

Other Staff College work included the design and the initial curriculum development of an Executive Development Program for local civil defense coordinators and preliminary work on the development of a course for State civil defense staffs.

The University of Chicago, under contract, continued to provide professional support and consulting services to the Staff College. Staff development workshops and seminars were conducted in Communications, Management Principles, Radiological Defense, Tests and Measurements, and Discussion Leadership.

Staff College also developed training materials for use in civil defense courses and conferences and provided technical advice and assistance for the development of training films for local civil defense personnel.

Community Shelter Planning (CSP) training program.—CSP training is essential to an effective civil defense program because it provides specific instruction for the effective preparation of a Community Shelter Plan and for its ultimate use as the base for preparing the community's emergency operations system.

Implementation of the Community Shelter Planning Program on a national scale requires training three distinct categories of people: (1) Urban planners, who produce community shelter plans for the jurisdiction(s); (2) the civil defense director for the local jurisdiction(s), who is responsible for the overall emergency operations plan based on the community shelter plans; and (3) the State CSP officer, who provides planning, staff advice, and assistance in the State to civil defense offices not covered by Federal CSP contracts.

Training that these individuals need is of two types: (1) Instruction on how to apply general planning techniques in community shelter planning, and (2) training in civil defense policy, programs, and planning.

OCD continued its CSP training by contract with the University of Tennessee during fiscal year 1968, through workshops, conferences, and seminars. During the year, 132 persons were trained in nine CSP workshops for urban planners, 67 persons were trained in three CSP work-

shops for officials, 95 persons attended six non-contract process courses, and 100 previously trained persons attended four conferences for planners. During fiscal year 1968, the first of a series of workshops was held for faculty members of universities with urban planning departments, and 26 persons attended. These conferences are designed to show faculty members how they can incorporate CSP in their curriculum.

Civil Defense University Extension Program (CDUEP).—The extension divisions of land-grant colleges and universities have a unique capability in civil defense education and training through their faculties and their experience in local communities. The CDUEP, which began in fiscal year 1963, is based on two major premises: (1) That civil defense education and training must be effectively carried on at the local level to achieve operational readiness, and (2) that civil defense education and training must make maximum use of existing instructional resources, avoiding the development of special facilities used only for civil defense. Under contracts with OCD, the extension divisions of the colleges and universities use their extensive resources to conduct conferences for government officials and community leaders and give training courses to improve defense operational readiness in local communities.

During fiscal year 1968, the CDUEP brought civil defense training to 52,673 State and local personnel, making a total of 240,961 participants in the program since its inception in fiscal year 1963. Using the existing extension capability of educational institutions, the program in fiscal year 1968 included contracts with 54 universities and colleges in 50 States, the District of Columbia, and Puerto Rico.

Through 518 conferences, a total of 26,039 State and local officials, key community leaders, and personnel in business and industry were briefed on civil defense. In 385 classes, 5,653 instructors were trained: 2,622 in shelter management and 3,031 in radiological monitoring. In addition, refresher training in radiological monitoring was given to 310 instructors in 31 classes. Staff and operations training was given to 2,214 key staff personnel in 151 classes in civil defense management, for 1,310 radiological defense officers in 114 classes, and for 1,372 key staff personnel in 82 plans and operations courses. End-product training was conducted for 4,390 shelter managers in 265 classes, 3,744 radiological monitors in 255 classes, and 6,798 public officials received training in 162 Simulation of Emergency Operations classes.

Continued use and growth of the CDUEP indicates that both public officials and the general public are experiencing an increasing awareness and knowledge of organization and individual responsibilities. In addition, their acceptance of the responsibilities and involvement in

the training sessions, is resulting in a general strengthening of the operational capability of the system and emergency action of the general public.

Radiological monitor training by the Army.—The mission of this program is to use the U.S. Continental Army Command (US CONARC) capability to train civilian radiological defense monitors for civil defense. The program also provides a means to incorporate training on the role of the armed forces in providing radef support to civil defense under a national emergency involving a nuclear attack.

Requests for the OCD-sponsored radiological monitor training originate at State and local levels and are directed into appropriate channels by OCD regional offices. Later the Army installation providing the training and the local civil defense official agree upon schedules and training locations.

Funds for the radiological monitor training given by the Army are provided by the Office of Civil Defense. Radiological monitors trained by the USCONARC for fiscal year 1968 totaled 499, making a cumulative total of 17,955 trained by CONARC since the beginning of the program in April 1963.

There has been a gradual reduction in the number of civilians trained through this program, due primarily to the increasing use of similar training offered through the Civil Defense Adult Education training program.

Explosive ordnance reconnaissance.—USCONARC continued to train local and State police in explosive ordnance reconnaissance. More than 6,000 were trained during fiscal year 1968, increasing the cumulative total to more than 56,000. More than 2,500 police were also trained in techniques for dealing with explosive and sabotage devices, increasing the number so trained to more than 16,000.

Public Education

Use of the resources of public schools and educational systems in support of the civil defense program, during fiscal year 1968, was achieved principally by liaison with national education associations and the Department of Health, Education, and Welfare.

National education associations.—Leadership represented in national education organizations can provide the "know how" necessary to incorporate civil defense concepts and principles into the nation's school system effectively. To this end, OCD, during fiscal year 1968, participated in the annual meetings of these organizations and worked with their elected officials to provide the membership with guidelines for action to advance disaster preparedness in schools and colleges.

Although there were no available funds for this program during

fiscal year 1968, a booklet titled "Civil Defense—A Vital Concern to PTA," was completed and will be distributed early in fiscal year 1969. This project was established with the National Congress of Parents and Teachers (PTA) late in fiscal year 1967.

Civil Defense Adult Education Program (CDAEP).—It is the responsibility of government to inform citizens of protective measures to enhance their chance of survival in the event of a nuclear disaster. The Civil Defense Adult Education Program is a means by which the Federal Government participates with State and local governments to meet this responsibility by providing adults with a basic understanding of civil defense and instruction on individual, family, and community protection against the effects of nuclear weapons.

Through local, State, and Federal educational leadership and co-operation, Personal and Family Survival courses are made available to out-of-school adults in communities throughout the country.

The resources of the adult education system also are used to train selected adults to serve as radiological monitors and shelter managers in support of civil defense emergency operations.

The Federal Government finances the CDAEP and is responsible for its overall planning and direction. The program is conducted mainly under the direction of chief State school officers through contract with the Office of Education. In most cases, the chief State school officer delegates the responsibility to a State civil defense adult education coordinator. The latter also works with local school officials in recruiting and training teachers for these courses. Instructional materials are supplied by the Federal Government. State civil defense adult education staffs and local civil defense adult education teachers are paid with Federal funds.

Since its inception on a trial basis in four States in fiscal year 1960, the Civil Defense Adult Education Program has expanded to now include 48 States, the District of Columbia, and Puerto Rico. During this time, almost 2.3 million adults and teachers have completed the personal and family survival course, and 96,200 radiological monitors have been trained.

The scope of the program was further increased during fiscal year 1968 to include training of shelter managers in direct support of the community shelter planning program. As a result of this expanded training effort, 8,577 shelter managers were trained.

Additional activity in the CDAEP during fiscal year 1968 included presentation of the Personal and Family Survival course over selected television stations in the States of Maine, Massachusetts, and Texas. The data on audience participation and individual learning obtained through evaluation of these special projects will be used to assess the

feasibility of placing greater emphasis on this means for civil defense mass education during fiscal year 1969.

Medical Self-Help (MSH) training program.—The Medical Self-Help training program pertains directly to the humanitarian needs envisioned in shelter utilization and to the increase of community readiness for whatever disaster may occur. People trained under this program are ready to assist others in matters of health and medical care in community shelters, an important capability when medical professionals are not present.

The program is managed by the U.S. Public Health Service using funds made available by the Office of Civil Defense. The administration of the Medical Self-Help program below the Federal level is the responsibility of the State. At the State level, the Health Department or the civil defense office is the administrative agency responsible for program control and for distribution of all training kits to communities and support groups. At the community level, Health Department or civil defense officials implement and administer the program. However, in order to secure the support needed, all industrial, church, civic, welfare, Red Cross, school, and rural organizations are asked to play a supporting role and participate actively in the organization of classes. Instructors serve on a voluntary basis.

All 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, and Guam participated in the Medical Self-Help training program during fiscal year 1968, resulting in the training of approximately 2.3 million persons. The total number of persons trained since the program's implementation in 1963 was 8,260,606.

During the fiscal year, the Medical Self-Help Humanitarian Award was established. Through this award, persons who have saved lives through knowledge gained from Medical Self-Help training are recognized. The recipient receives an inscribed silver medal and an appropriate certificate. Five such awards had been presented by June 30, 1968.

Training Evaluation and Improvement

Under contract to OCD, the National League of Cities (NLC) completed its study which identified training programs made available to local government employees and officials by local and State governments, universities, and national associations. This study also provided OCD with an analyses of State statutes and significant legal enactments pertaining to, or affecting, local training. In addition, the NLC developed recommendations and procedures for (1) integrating civil defense training into local government training programs, (2) implementing procedures for keeping the local government training program inventory current, and (3) making programs available to

potential users. OCD is studying these recommendations before developing plans for incorporating civil defense into existing training programs for municipal employees.

Five graduate fellowships, awarded under the prototype Graduate Fellowship Program, will be completed in November 1968, and the sixth fellowship was renewed for a second year of study. The thesis and research reports, on subjects related to civil defense or government operations in emergency, will be studied, in-house by OCD, to determine their applicability to on-going or proposed OCD programs.

The evaluation of the Civil Defense Adult Education Program, conducted under contract by Systems Development Corporation, is nearing completion. Phase I, an analysis of the operation of the program in six States, is completed. Phase II, a study of the impact of the CDAEP, is underway. This phase seeks information on (1) the attitude of adults toward civil defense, (2) knowledge of adults as to principles and practices of civil defense, (3) steps adults take for personal and family survival, (4) increase in public support of civil defense, and (5) increased involvement of schools and school officials in civil defense training and education. Phase III, an analysis of the management of the program at national level, has been completed and will be incorporated along with Phases I and II into a final report to be submitted to the Office of Civil Defense in September 1968.

The evaluation of the Civil Defense University Extension Program (CDUEP) was continued, and the University of Kansas, under its support contract, completed collection of data on Emergency Operations Simulations in 32 cities. This evaluation is designed to determine their impact and cost effectiveness as a part of the total program. Results of the effort have shown the need for a total system evaluation of the CDUEP.

Plans and preparations for a field test of the Self-Help Emergency Firefighting Training materials, scheduled for September 1968, are nearly completed. The training materials will be tested, under the supervision of the International Association of Fire Chiefs, in 100 political jurisdictions involving approximately 5,000 citizens. The classes will be taught by local fire department personnel from all types and sizes of fire departments under the supervision of representatives of the International Association of Fire Chiefs who have contracted with OCD to conduct the field test. Upon completion of the test, necessary revisions will be made of the materials and plans completed for national implementation.

A seminar on "Application of Social Science to Civil Defense Problems" has provided material for a new course for State and local civil defense coordinators. Both this course and the new course for

OCD Regional Field Officers incorporate content recommended at the conclusion of the seminar. To date, one Regional Field Officer Institute has been conducted, and a second is scheduled for early fiscal year 1969.

Training Materials

During fiscal year 1968, OCD continued the development and production of training materials to give logistical support to on-going training programs conducted by the Staff College, the Civil Defense University Extension Program, the Civil Defense Adult Education Program, local communities, and related support training.

Training material development during the fiscal year concentrated on preparation of new or revised materials for use by the 54 universities in the Civil Defense University Extension Program, and the revision, field testing, and nationwide implementation of one home study course titled "Civil Defense U.S.A."

The Shelter Management Training Instructor Guide was prepared under contract, and 10,000 new copies were distributed for use in civil defense training packages.

In support of the Emergency Operations Simulation Exercise (EOSE) training, 180 sets of emergency operations simulation exercise kits were prepared for use by universities and the OCD Staff College. These sets consist of 45 EOST Operations Manuals, 15 EOST Simulation Manuals, 350 Emergency Report Forms, 200 General Message Forms, 100 Radiation Report Forms, 150 Shelter Complex Loading Forms, 100 Shelter Complex Data Forms, and 20 Unit History Charts.

The revision, final field testing, and deployment of the "Civil Defense U.S.A." home study course was completed. More than 1,800 students enrolled in the field testing, with 775 students completing the course by June 30, 1968. A total of 120,000 sets of these course materials were prepared. The course study materials include five programmed instruction text books, five test cards on course examination, and one course completion certificate. Through a cost reimbursable contract with the Kellogg Community College, Battle Creek, Mich., assistance was obtained for course record keeping, test grading, and enrollment processing.

A new home study course for the local civil defense director was prepared by Staff College personnel during fiscal year 1968 for field testing and deployment in fiscal year 1969. In addition, the Student Workbook for the Radiological Defense Officers Course, and the Radiological Monitoring Student Workbook were revised and prepared for distribution early in fiscal year 1969.

Preliminary planning for the conduct of CDUEP Shelter Manager and CDUEP Conference Workshops to be held at the OCD Staff College during fiscal year 1969 had been completed.

Rural Civil Defense

A special civil defense information and education program for rural areas was continued in fiscal year 1968. This work, conducted under contract with the Field Extension Service of the U.S. Department of Agriculture (USDA), was carried on by approximately 11,000 extension agents at the county level and about 3,200 agriculture specialists at the State level. Funds furnished under the contract enabled each State to have a full-time rural civil defense leader and resulted in the USDA providing a small supervisory and field staff at the Federal level. Budgetary limitations, however, require the elimination of this full-time State leader position in fiscal year 1969.

Started in fiscal year 1963, the rural civil defense information and education program extends to an audience of approximately 70 million persons, most of whom reside in cities and towns of less than 10,000 population.

This program explains how fallout protection can be provided on farms and in small communities, since most public fallout shelters are located in large cities. Special attention is given to the protection of livestock and feed, water and food products.

During the 1968 fiscal year, the Field Extension Service held more than 68,235 educational meetings which incorporated some phase of RCD into the program. More than 1,490,000 persons attended. The Field Extension Service also stressed RCD through other educational media, including 1,169 television programs, 10,463 radio broadcasts, and more than 10,560 press releases to rural newspapers. Exhibits featuring RCD information at fairs, field days and similar events totaled 4,896. Finally, 5,880,000 copies of RCD materials were distributed either upon request or in connection with educational programs during the fiscal year.

Almost half of the participants at Field Extension RCD educational meetings were members of 4-H clubs. This age group (9-19) has shown an active concern for survival from radioactive fallout and is an important influence on families to take active measures for fallout protection.

Educational work in agriculture is accomplished through existing organizations such as the Livestock Breeding Association, crop-producing groups and similar commodity interest groups. This makes it almost imperative that the RCD message be linked with the concerns of each group. Specialists from nearly every field of subject matter have participated in one or more States.

Because of the close tie between housing and farm structures and rural fallout shelters, agricultural engineers have played a significant role, particularly in those eight States which employ RCD agricultural engineers. After attending the Fallout Shelter Analysis Workshops, agricultural engineers conducted 44 Rural Shelter Analysis Workshops in 10 States and trained 737 persons. The engineers also developed technical reference materials and participated in the training of agriculture staff at public education meetings.

The Rural Civil Defense program exemplifies the use of existing government resources to realize its goals. Effective in fiscal year 1969, the Department of Agriculture Organization for Emergency Preparedness Functions will incorporate the Rural Civil Defense program into the various phases of the regular on-going activities of the cooperative extension service. This includes providing for civil defense training to local leaders, helping to organize local action groups, and acquainting rural residents with the assistance available to them through local civil defense agencies.

A handwritten signature in dark ink, reading "Joseph Romm". The signature is fluid and cursive, with a long, sweeping underline that extends to the right.

JOSEPH ROMM,
Director of Civil Defense.

EXAMPLES OF OPERATIONAL CAPABILITIES OF STATE AND LOCAL CIVIL DEFENSE ORGANIZATIONS IN COMBATING THE EFFECTS OF PEACETIME DISASTERS DURING FISCAL YEAR 1968

Hurricane Beulah—Puerto Rico and Texas—September 1967.—After striking Martinique, the Dominican Republic and the Yucatan Peninsula of Mexico, Hurricane Beulah proceeded to the coast of Texas ultimately causing displacement of almost a million persons and property damage estimated at one billion dollars. Communications and utilities also were disrupted due to flooding.

On September 19, 1967, staffs at the Texas State Civil Defense Emergency Operating Center and OCD Region Five were placed on 24-hour alert. Texas Governor John Connally conferred with State agency representatives and the Adjutant General at the Emergency Operating Center, and contacted mayors and county judges in the areas threatened. Evacuation of coastal areas and low areas around Brownsville was completed by nightfall. American Red Cross shelters were opened, and 1,300 National Guard troops were activated.

The following day, Hurricane Beulah knocked out land line communications a few miles above Brownsville and caused many power failures. Tides as high as 20 feet virtually destroyed some low coastal areas. That evening Beulah entered Mexico accompanied by 85 or more tornadoes. Several casualties resulted.

The OCD national office had begun plotting the hurricane track as soon as it was located by the U.S. Weather Bureau and disseminating information to the headquarters staff. Close liaison was maintained between OCD headquarters and the Regions affected. The National Headquarters Emergency Operations room was activated and remained operational until the hurricane threat passed. Continuous communications contact was maintained with the National Three Warning Center and, through it, to the Regional Warning Centers.

At a later news conference, Governor Connally highly praised the OCD and local government. He detailed the functions of civil defense, especially in the areas of warning and communications, and mentioned the 24-hour alert at the State Emergency Operating Center.

The Governor also reported that OCD shelter supplies, including food, water, chemical toilets, and medical provisions, stored at cities had been made available for use by shelter occupants. OCD also had made available the National Warning System and the National Communications System. In addition, OCD offered emergency generators, water purification units, and engineering equipment from stocks at Bastrop, Tex.

State Civil Defense Coordinator, Mr. C. O. Layne, reportedly called the low number of fatalities a tribute to Governor Connally's firm stand on evacuation and also the expert action by experienced civil defense and government forces.

Collapse of Ohio River Bridge—December 15, 1967.—Civil Defense forces were again at work in rescue operations after the collapse of the Silver Bridge over the Ohio River at Kanauga, Gallia County, Ohio, and Point Pleasant, W. Va. At the time, 36 deaths were reported, 10 persons were missing and presumed dead, and 10 were injured. Bridge damage was estimated at \$8 million.

The Ohio State Deputy Director of Civil Defense was in charge at the scene on the Ohio side. Ohio State Civil Defense and 19 Ohio counties provided manpower and equipment to assist in search and rescue operations. State and local civil defense also provided communications.

Ohio Civil Defense personnel continued to search for bodies until March with maximum efforts during the weekends when, in response to calls from the Deputy Director, Civil Defense units throughout Ohio aided with men and search craft. Five more bodies and the last missing automobile were recovered before the operation was terminated on March 31.

DESCRIPTION OF PUBLIC FALLOUT SHELTER SUPPLIES

General Shelter Supplies, Radiation Kits, and Packaged Ventilation Kits (PVK's)

Food rations.—Food rations, providing 10,000 calories and amounting to 5 pounds in weight per shelter occupant, are austere but adequate for sedentary conditions and estimated duration of shelter occupancy. The food is packaged in hermetically sealed cans having a capacity of 2½ or 5 gallons. These containers and special formulation of the food products are expected to assure that the food will remain usable for as long as 15 years after storage.

The Armed Forces Food and Container Institute, now the Army Natick Laboratories, developed specifications for the food items. There are: (1) A survival biscuit—a baked wheat flour biscuit containing small amounts of corn and soy flour—developed by the National Biscuit Co. for the New York State Civil Defense Commission; (2) a survival cracker—a baked wheat-corn cracker containing more corn flour than the survival biscuit, but no soy flour—developed by the Midwest Research Institute for the State of Nebraska; (3) a bulgur wafer—containing parboiled bulgur wheat that has been dried, puffed, and blended with several ingredients—developed by the U.S. Department of Agriculture; and (4) a carbohydrate supplement containing sucrose, glucose, and flavorings—adapted from a standard product in accordance with a military specification.

The physiological fuel value of each of the 4 dry food items is approximately 2,000 calories per pound. The basic ration of 10,000 calories per shelter occupant contains proper components of protein, carbohydrate, and fat. The protein content is low, since consumption of high protein foods increases renal activity and would require consumption of water in excess of limited amounts expected to be available in shelters. In accordance with established nutritional requirements, the carbohydrate supplement is limited to one-third the weight of the total food ration. The ration contains sufficient salt to preserve body fluids, but vitamin fortification is not necessary, and deficiencies in calcium, phosphorous, or potassium would not be of serious consequence during the limited period of shelter occupancy.

Food rations do not provide for special nutritional requirements of infants, young children, pregnant women, or those who are aged or ill. Special foods required by them must be brought into the shelter by the individuals or families concerned.

Sanitation kits.—Sanitation kits, designed for waste disposal during shelter occupancy, are provided. Two kits are available: one with supplies to serve 25, and the other with supplies to serve 50 persons.

Each kit includes a 17½-gallon fiber drum packaged with toilet seat, toilet tissue, commode chemical, sanitary napkins, drinking cups for individual use, and other items. Packaged with each kit are instructions for its use. The toilet seat is designed to be used with the fiber drum as a chemical toilet, and as water containers are emptied, they can be used in the same manner. This method of waste disposal has been used satisfactorily in shelter occupancy tests conducted as part of OCD research projects.

Assembly of the kits is on the schedule of *Blind Made Products* under terms of the Wagner-O'Day Act of June 1938 (52 Stat. 1196; 41 U.S.C. 46-48). Workshops for the blind throughout the country therefore assemble the individual kit items. The National Industries for the Blind selects these workshops and competitively procures the kit components through centralized procedures that assure the advantage of volume purchasing. Eleven workshops have performed the tasks of assembling sanitation kits.

Medical kits.—Medical kits are provided in two sizes: one to serve 50-65 persons, the other to serve 300-325. These kits contain different quantities of identical items that provide as austere capability to save lives and alleviate suffering by (1) preventing disease and checking its transmission, (2) controlling emotional stress, and (3) controlling disease symptoms to alleviate pain and prevent complications. Medication and devices are not provided for chronic diseases, childbirth, or for purposes that require a high degree of professional proficiency.

Since health status, skills proficiency, and professional ability of shelter occupants can be estimated only generally, the kits are designed for nonprofessional use and contain nontechnical instruction booklets. The National Academy of Science—National Research Council; U.S. Public Health Service, Division of Health Mobilization; and DoD medical authorities have approved the items in the kit. Contents are adequate to serve emergency needs generally of normal, healthy persons.

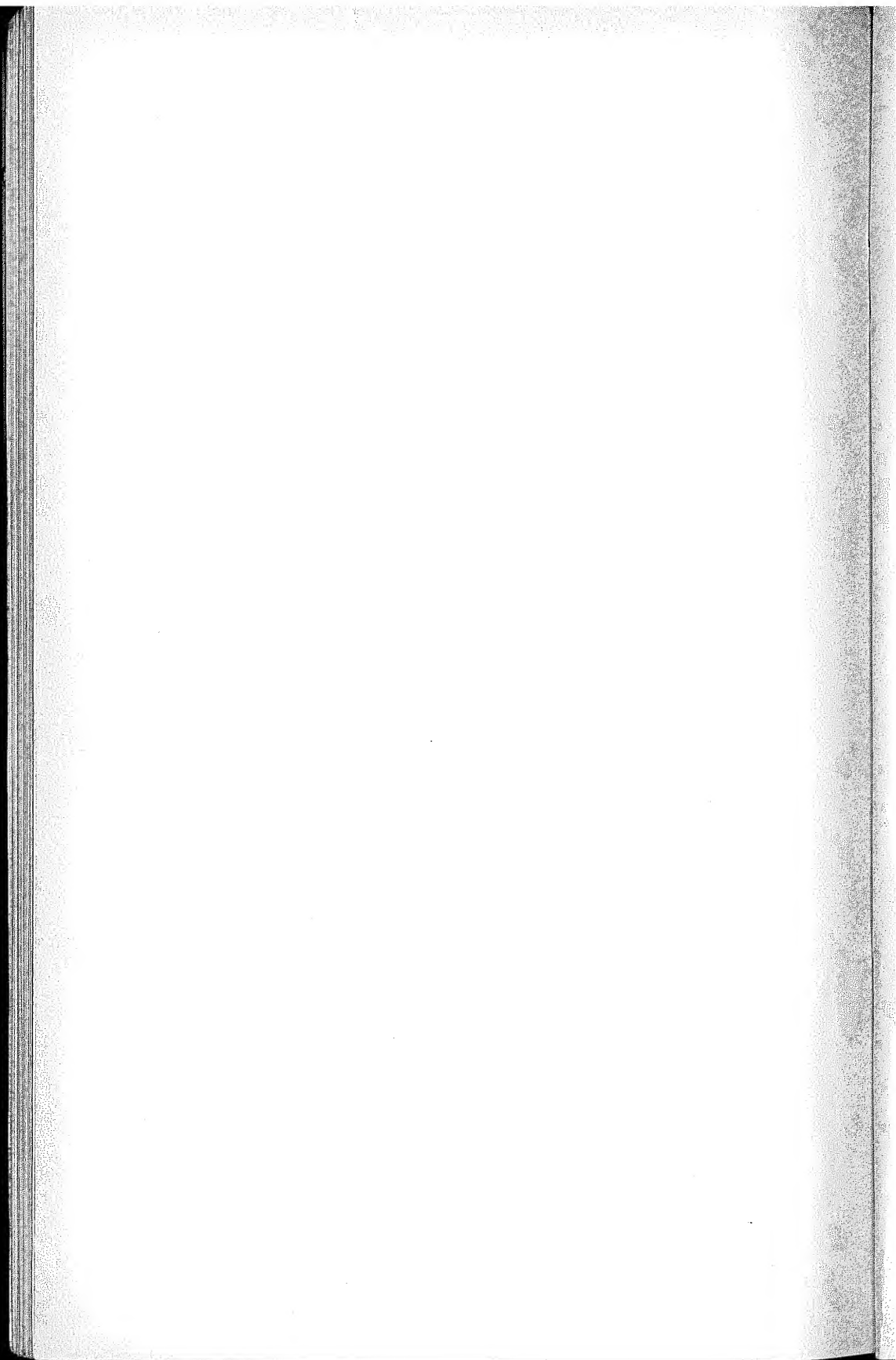
Water containers.—The containers are 17½-gallon, lightweight steel drums supplied with a double polyethylene liner. The drums are filled at the shelter site with water from sources meeting Public Health Service standards. One container is intended to serve five shelter occupants, and tests have shown that this method is suitable for long-range storage of potable water. During shelter occupancy, the empty water containers may be converted to chemical toilets by using appropriate items contained in the sanitation kits.

Radiation kit.—At least one radiation kit, to be used by trained radiological monitors, is supplied each public fallout shelter. The kit contains: (1) A low range beta-gamma discriminating survey meter (CD V-700), known as a Geiger counter, for monitoring personnel, food, and water; (2) a high range survey meter (CD V-715) or ion chamber for monitoring inside and outside the shelter; (3) two dosimeters (CD V-742) for measuring personnel exposure; and (4) a dosimeter charger (CD V-750) to reset and recharge the dosimeters.

Use of this equipment during shelter occupancy will enable the radiological monitor to (1) locate the shelter area offering greatest protection, (2) evaluate contamination of personnel and material brought into the shelter, (3) determine when adjoining areas are sufficiently free of radiation to be used for relieving overcrowding, (4) control radiation exposure of persons performing emergency functions, and (5) provide radiological data on the surrounding area to the shelter manager and the local emergency operations center.

Packaged Ventilation Kit (PVK)

The PVK is packaged in two units. Unit A, weighing 103 pounds and having a volume of 8.6 cubic feet, contains a fan assembly with a stand, duct adapter, and accessories. Unit B, weighing 38.5 pounds and having a volume of 5 cubic feet, contains a drive module with saddle, pedals, chain, and handlebar. This is known as a type I PVK. The kit may also be issued as a type II PVK which includes two B-units and permits two persons to operate the fan. The fan may be operated electrically as well as manually. The shelter occupancy can be increased considerably by use of the PVK.



Appendix 3



Office of Civil Defense Instruction

OFFICE OF THE SECRETARY OF THE ARMY

DATE August 5, 1966

NUMBER 5120.2

MGT (MO)

ADVISORY COMMITTEE ON THE DESIGN AND CONSTRUCTION OF PUBLIC FALLOUT SHELTERS

- References: (a) Federal Civil Defense Act of 1950, as amended (50 U.S.C. App. 2251-2297)
- (b) Executive Order 10952 of July 20, 1961
 - (c) DoD Directive 5160.50 of March 31, 1964
 - (d) Secretary of the Army memorandum of April 1, 1964, Organization and Operation of the Office of Civil Defense and Delegation of Administrative Authorities for Civil Defense Functions

1. General

By virtue of the authority contained in reference (a), as redelegated to me by reference (b), (c) and (d), I hereby continue the Civil Defense Advisory Committee on the Design and Construction of Fallout Shelters. The purpose, membership, and operation of the committee are set forth below.

2. Purpose

The purpose of the Committee is to advise the Director of Civil Defense in the following matters:

- a. Review and make recommendations on the technical problems related to fallout shelter design and construction including Federal programs to overcome fallout shelter deficits.
- b. Provide means for effective communications relating to shelter design and construction between the Office of Civil Defense and the membership of the associations named below.
- c. Recommend methods of stimulating shelter construction through development of plans and designs, by reducing shelter construction costs, and by communicating technical information conducive to shelter construction to architects, engineers, contractors, and building owners.

3. Membership

This Committee shall be representative of the American Institute of Architects, the American Society of Civil Engineers, the Associated General Contractors of America, Incorporated, the National Society of Professional Engineers, the Engineers Joint Council, the American Institute of Planners and the Consulting Engineers Council. Total membership shall consist of fifteen members.

a. There shall be two members from each of the seven professional organizations named above. One of the two members shall be an officer, the other a staff member, of the organization represented.

b. One member, a full time, salaried Government official designated by the Director of Civil Defense, shall be Chairman of the Committee.

c. If a vacancy occurs on the Committee, it shall be filled in the same manner as the original appointment.

4. Operation

a. The Committee shall be organized and operated in accordance with the references and with applicable DOD and OCD directives and instructions.

b. The Chairman shall call each meeting of the Committee, and shall formulate the agenda of each meeting. He shall make provision for taking minutes of each meeting, and shall certify the accuracy of summary minutes thereof. He shall have the authority to adjourn any meeting whenever he feels that its continuation would not be in the public interest.

c. The functions of the Committee are solely advisory, and any determination of action to be taken, based in whole or in part on such advice, shall be made by the Director of Civil Defense



WILLIAM P. DURKEE,
Director of Civil Defense.

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Staff College (10 cys)

MEMBERSHIP LIST

ADVISORY COMMITTEE ON THE DESIGN AND CONSTRUCTION OF PUBLIC FALLOUT SHELTERS

Meeting Date—November 20, 1967

Office of Civil Defense:

<i>Designee</i>	<i>Name, Title, and Affiliation</i>	<i>Address</i>
1. Chairman-----	Mr. James E. Roembke, deputy assistant director of Civil Defense, Technical Services, Office of Civil Defense.	The Pentagon, Washington, D.C. 20310.
Executive Secretary.	Mr. Robert Berne, chief architect, Technical Services, Office of Civil Defense.	The Pentagon, Washington, D.C. 20310.

American Institute of Architects:

2. Co-chairman----	Mr. John W. McLeod, board member, Washington Metropolitan Chapter, American Institute of Architects.	1705 De Sales St. NW., Washington, D.C. 20036.
3. Staff Member---	Mr. William H. Scheick, executive director, American Institute of Architects.	1735 New York Ave., NW., Washington D.C. 20006.
Alternate Staff---	Mr. M. Elliott Carroll, administrator of Public Services, American Institute of Architects.	Do.

American Society of Civil Engineers:

4. Officer-----	Mr. Howard G. Dixon, Howard G. Dixon, Inc.	284 Putnam Ave., Freeport, N.Y. 11520
5. Staff Member---	Mr. William H. Wisely, executive secretary, American Society of Civil Engineers.	345 East 47th St., New York, N.Y. 10017.
Alternate staff member.	Mr. D. P. Reynolds, assistant executive secretary, American Society of Civil Engineers.	345 East 47th St., New York, N.Y. 10017.

Associated General Contractors of America, Inc.:

6. Officer-----	Mr. D. E. Verlander, president and director of A. L. Jackson Co.	3423 North Drake Ave., Chicago, Ill. 60018.
7. Staff member--	Mr. Joseph Ashooh, director, Utilities Construction, Associated General Contractors of America, Inc.	1957 E St., Washington, D.C. 20006.

<i>Designee</i>	<i>Name, Title, and Affiliation</i>	<i>Address</i>
<i>National Society of Professional Engineers:</i>		
8. Officer-----	Mr. John H. Stufflebean, president, National Society of Professional Engineers.	211 West Pennington St., Tucson, Ariz. 85701.
9. Staff member--	Mr. Paul Robbins, executive director, National Society of Professional Engineers.	2029 K St. NW., Washington, D.C. 20006.
Alternate officer.	Mr. Leo Ruth, vice president, National Society of Profes- sional Engineers.	919 The Alameda, San Jose, Calif. 95126.
<i>Engineers Joint Council:</i>		
10. Officer-----	Mr. R. H. Tatlow III, presi- dent, Abbott, Merkt & Co., Inc.	630 Third Ave., New York, N.Y. 10017.
11. Staff member--	Mr. Carl Frey, secretary, Engineers Joint Council.	345 East 47th St., New York, N.Y. 10017.
<i>American Institute of Planners:</i>		
12. Officer-----	Vacancy.	
13. Staff member--	Mr. Robert L. Williams, executive director, American Institute of Planners.	917 15th St. NW., Room 800, Washington, D.C. 20005.
<i>Consulting Engineers Council:</i>		
14. Officer-----	Mr. J. Gibson Wilson, Jr., J. Gibson Wilson and Associates.	1469 Church St. NW., Washington, D.C. 20005.
15. Staff member--	Mr. Donald A. Buzzell, executive director, Con- sulting Engineers Council.	1155 15th St. NW., Washington, D.C. 20005.

Note. Numbers to left of names designate official committee members.

Appendix 4



Office of Civil Defense Instruction

OFFICE OF THE SECRETARY OF THE ARMY

DATE May 16, 1968

NUMBER 5620.3

PO (EO)

MEMORANDUM OF UNDERSTANDING WITH THE UNITED STATES COAST GUARD

1. Purpose and Scope

This instruction transmits, for the information and guidance of all personnel, departmental and field, a copy of a Memorandum of Understanding between the Office of Civil Defense (OCD) and the United States Coast Guard (USCG).

2. Responsibilities

The Assistant Director for Plans and Operations is responsible for carrying out the functions assigned to the Office of Civil Defense.

JOSEPH ROMM,
Acting Director of Civil Defense.

Attachment

OCD-USCG Memo

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G(FldOffDirs)

**MEMORANDUM OF UNDERSTANDING
CONCERNING THE
CIVIL DEFENSE WARNING SYSTEM
BETWEEN
THE OFFICE OF CIVIL DEFENSE
AND
THE UNITED STATES COAST GUARD**

I. Purpose

The purpose of this memorandum is to identify and fix by agreement the responsibilities, functions, and working relationships of the United States Coast Guard (USCG) and the Office of Civil Defense (OCD), to provide warnings to merchant shipping in or close to the territorial waters of the United States in accordance with existing laws and directives.

II. General

Pursuant to Executive Order 10952, July 20, 1961, all functions and authority transferred to the President by Reorganization Plan No. 1 of 1958, including the authority to make appropriate provision for necessary civil defense communications and dissemination of warnings of enemy attacks to the civilian population, under Section 201 (c) of the Federal Civil Defense Act of 1950, as amended (Public Law 920, 81st Congress), are delegated to the Director of Civil Defense.

In accordance with Sections 2 and 91, Title 14, U.S.C., and Executive Order 10173, as amended, promulgated pursuant to Public Law 679, 81st Congress, Second Session, amending the Espionage Act of June 15, 1917, (50 U.S.C. 191), the United States Coast Guard is the Federal agency responsible for the safety of life and property on the high seas and on waters subject to the jurisdiction of the United States.

The successful accomplishment of the civil defense mission requires a close working relationship between the OCD and the USCG.

III. Responsibilities of the United States Coast Guard

A. Monitor NAWAS 24 hours per day at the Rescue Coordination Centers where NAWAS is installed, and acknowledge all tests of the system.

B. Designate the Coast Guard Radio Stations to which the Rescue Coordination Centers will forward OCD warnings of enemy attack and radiological fallout for broadcast to merchant vessels in or close to the territorial waters of the United States, provided that:

1. None of the information disseminated is inimical to the national security, and

2. Such broadcasts do not conflict with high priority Coast Guard communications.

IV. Responsibilities of the Office of Civil Defense

A. In coordination with, and without cost to the United States Coast Guard, provide equipment, communications services and facilities required to receive information of enemy attack and radiological fallout from OCD at the Rescue Coordination Centers mentioned in paragraph III of this memorandum.

B. Advise the Commandant, United States Coast Guard of the operational capabilities and limitations of the National Warning System and of the current policies and operational procedures of the system.

C. Supply the selected Rescue Coordination Centers with edited information on enemy attack and radiological fallout, and request that the information be broadcast.

V. Review and Revision

This memorandum will be reviewed and revised from time to time as may be required and desirable.

APPROVED:

OFFICE OF CIVIL DEFENSE

BY /s/ J. Romm

DATE November 15, 1967

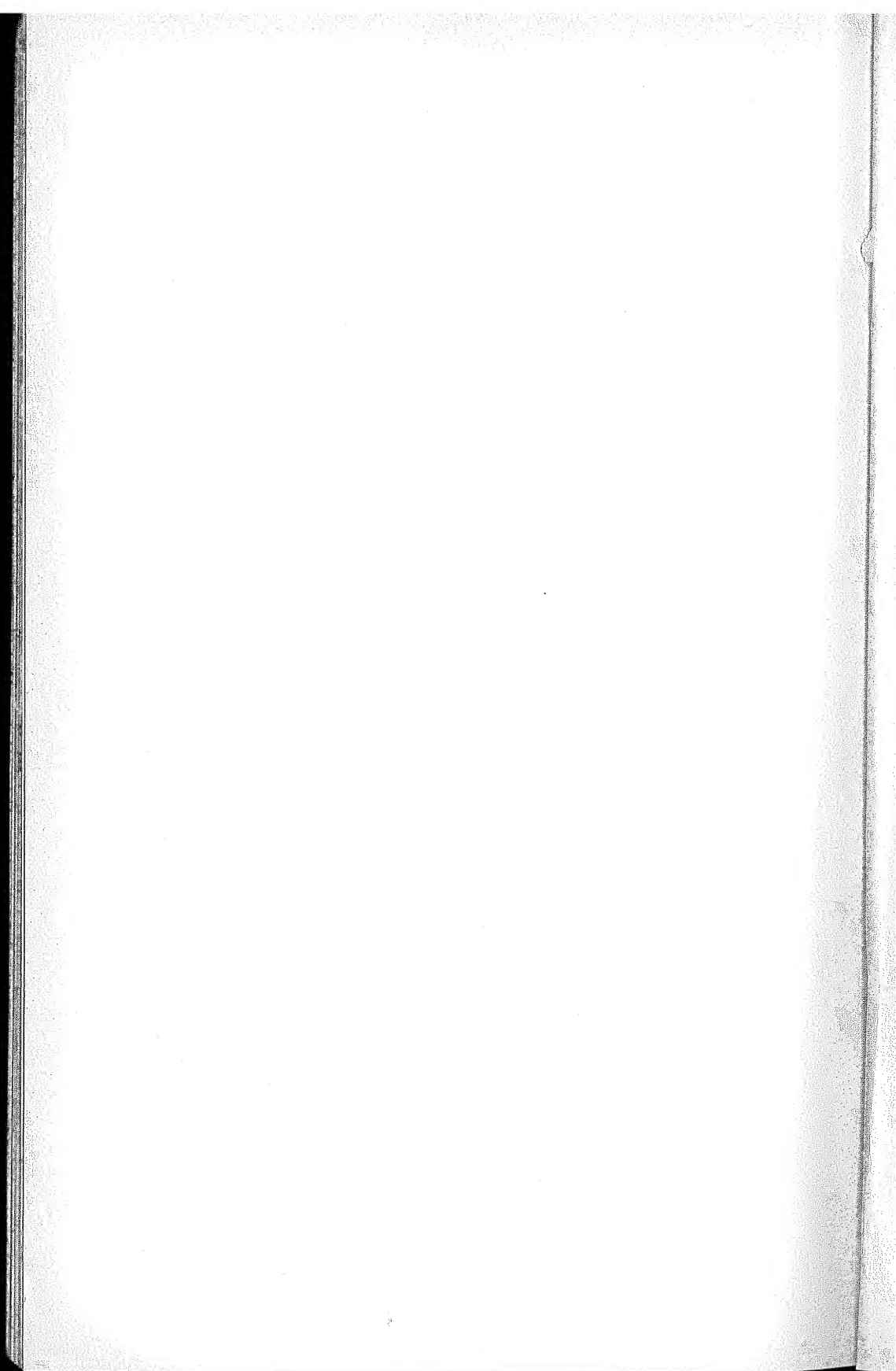
UNITED STATES COAST GUARD

By /s/ R. W. Goehring

R. W. Goehring

Chief, Office of Operations

DATE 10 October, 1967



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